

Subject Index

A

- Accounting; *see also* Financing, Records commercial department; costs of, in U. S. cities, 1373
 procedure for, for a group of small plants, 2201
 depreciation; statement on, to A.W.W.A. directors, 359
 methods of, in Denver municipal water works, 1648
- Activated carbon; *see* Carbon
- Administration; *see also* Management
 joint water and sewer account; report on, 1911
 sewerage system; new problems in, 1912
- Advertising; *see* Public relations
- Aeration; coke contact; combination of, with sand filtration for iron removal, 1935
 loss of chloramine residuals in, 2097
 taste and odor control by, 2125
- Agitator; surface; *see* Filters
- Air gaps; protection of cross-connections and inter-connections by, 441
 standards for, 1572
- Akron, Ohio; cement-mortar lining of water mains at, 1671, 1698
- Algae; control of, in impounding reservoirs, 705
 difficulties with, in filters, prevention of, by surface wash, 1230
 flagellated; two groups of, as indicators of clean water, 1099
 plankton; control of, by copper, chlorine and ammonia, 2108
- American Gas Association; opinion of, on special rates to federal housing projects, 1641
- American Standards Association; organization, purpose and functions of, 1584
 plumbing standardization work of, 1571
- Sectional Committee A-40; organization and membership of, 1579
- American Water Works Association;
 audit of association funds for 1940, report of, 774
 Board of Directors; action of, on Water Works Practice Committee report, 363
 committee reports; chlorine-ammonia treatment of water, 2079
 joint administration and collection of water and sewer accounts, 1911
 joint research on boiler feed water studies, 1402
 methods of determining fluorides, 1965, 2079
 specifications for filtering materials, 2021
 water conditioning methods to inhibit corrosion, 1534
 water treatment and laboratory control, 2051
 water works practice, 343
 committees; Steel Pipe Manufacturers Technical Advisory; rules and regulations of, 1719
 Steel Plate Pipe; current activities of, 1716
 Convention—1941, report of, 2227
 Indiana Section Technical Committee; Sub-Committee on Emergencies; progress report of, 1079
 Sub-Committee on Meter Settings; report of, 1666
 membership statement for, for 1943, 778
 publications of, list of, *a section of the December issue*
 relation of, to public relations problem, 93
 section meetings—1941, report of, 2237
 specifications; tentative; for cold water meters—displacement type, *a section of the December issue*
 for sluice gates, *immediately following page 1860*
 staff report; licensing and certification of water works operators, by states, 631

SUBJECTS

Ammonia; *see also* Chloramines
 nitrogen; determination of, 2113
 natural; relationship of, to formation of chloramines, 2095
 plankton control by, 2108
 residual; in distribution systems, 2095
 sources of; comparative value of, for formation of chloramines, 2095
 Ammonia-chlorine treatment; *see* Chloramination
 Analysis; *see also* Quality
 ammonia nitrogen, 2113
 bacteriological; relative value of 2- and 5-per cent brilliant green bile and lactose broth media in, 649
 size of test portions in, 1242, 1804, 2217
 dissolved oxygen; nomograph for, 1111
 drinking water; Treasury standard requirements in, proposed changes in, 1806, 2215
 flow; *see* Hydraulics
 fluorides; *see* Fluorides
 metal concentration; polarographic method of, 1544
 nitrates; by modification of the phenoldisulfonic acid method, 1589
 nitrite nitrogen, 2115
 residual chlorine; equipment for, availability of, for emergency use, 1325
 methods of, 2112
 photo-electric colorimeter for use in, 659
 solids; in water softening sludges, 747
 sulfide; in low concentrations, 943
 water; sampling methods for, in Venezuela, 281
 zinc; rapid; in water supplies, 246
 Annexation; application of, to water supply problems in metropolitan areas, 1876
 Anodes; cathodic protection; types of, 1508
 Appalachian Electric Power Co.; decision of Supreme Court against, on navigability of New River, 315
 Aqueducts; *see* Pipe, Transmission systems
 Arthurdale, W. Va.; control of iron bacteria by super-chlorination at, 168
 Asbestos rope; use of, in jointing mains, 772
 Automotive equipment; operation and

maintenance costs of, in U. S. and Canadian cities, 1362
 Auxiliary facilities; *see* Distribution systems, Supplies

B

Back-flow; preventers; standards for, 1574
 protection against; legal aspects of, 495
 practical aspects of, 391
 Back-siphonage; *see* Back-flow
 Bacteria; coliform; relationship of, to gastro-enteritis, 1430
 testing for, size of portions in, 1242
 use of 2- and 5-per cent brilliant green bile media in analysis for, 649
 destruction of, by chloramines, 2098
 gastro-enteritis-carrying; isolation of, 1430
 iron; control of, by super-chlorination, 168
 Bacterial corrosion; *see* Corrosion
 Bacteriology; *see* Analysis
 Baltimore; metropolitan district of, development of, 1880
 Billing; costs of, in U. S. cities, 1373
 joint water and sewer account, 1919
 methods of, at Cincinnati, 1214
 procedure for, for a group of small plants, 2201
 sewer account; procedure of, in special cases, 1921
 Birm; iron and manganese removal with, 1933
 Boilers; feed water for, *see* Feed water
 insurance of; inspection service and types of coverage offered for, 2192
 Bonds; *see* Financing
 Break-point chlorination; *see* Chlorination
 Brilliant green bile; *see* Media
 Brine; reclamation of, after use for zeolite regeneration, 271
 regeneration of synthetic zeolites with, 267
 Britain; defense of utility services in, 1440
 pollution prevention in distribution system in, 1116
 Buffalo, N. Y.; pumping station at, protection of, against service interruptions, 1586

C

- Calcination; sludge; lime recovery by, 741
- Calcium; carbonate; deposition of, in distribution systems, effect of sodium hexametaphosphate on, 1239
- hypochlorite; availability of, for emergency use, 1322
- Calgon; *see* Sodium hexametaphosphate
- California; Southern; mutual water companies in, problems of, 894
- Calking; *see* Pipe, joints in
- Canada; automotive equipment in, control of, 1364
- civil service in, 1609
- meter maintenance practice in, 1381
- water rate structures in, 1389
- water supplies of, investigation of, 967
- Carbon; activated; evaluation of, accuracy of threshold odor method of, 1945
- taste and odor control by, 2132, 2140
- Cathodic protection; experimental failure of, as protection against bacterial corrosion, 156
- history of, 1503
- tank; cost of, 1514
- experiences with, 1503
- ice problem in, 1508
- theory and practice of, 305
- Caustic soda; feeding of, for pH correction, 288
- Cement; gunite; construction of storage reservoir with, 863
- lining with; *see* Linings
- pipe jointing with, 769
- Certification; *see* Personnel
- Charcoal filters; *see* Filters
- Chemical feeders; availability of, for emergency use, 1323, 1327
- chlorinators; portable; design and use of, 1328
- Chemistry; *see* Analysis
- Chloramination; committee report on, 2079
- effect of, on pipe line capacity, 2102, 2103
- laboratory determinations relating to, 2112
- literature on, review of, 2080, 2121
- reduction of pipe friction losses by, 2103
- use of, extent of, 2085
- Chloramine; bactericidal value of, 2098
- formation of; comparative value of various sources of ammonia for, 2095
- conditions affecting, 2095
- relationship of, to natural ammonia nitrogen, 2095
- plankton control by, 2108
- residual; differential test for, 2115
- in distribution systems, 2095
- loss of, in aeration, 2097
- sterilization by, 2133
- taste and odor control by, 2097, 2134, 2137
- Chlorination; *see also* Chloramination, Sterilization
- break-point; inapplicability of, to some waters, 251
- de-; use of sulfur dioxide for, at Richmond, Va., 253
- emergency; application of, in disinfecting accidentally polluted water supply at Rochester, N. Y., 1339
- equipment for; types of, available for emergencies, 1319, 1327, 1344
- pre-; benefits of, and problems in, 250
- preparation of water for filtration by, 249
- super-; control of iron bacteria by, 168
- taste and odor control by, 2131, 2135
- taste and odor problems introduced by, 2130
- Chlorinators; *see* Chemical feeders
- Chlorine; *see also* Chloramine
- availability of, for emergency use, 1321
- effectiveness of, in destruction of cysts of *Endameba histolytica*, 1710
- plankton control by, 2108
- residual; determination of, photoelectric method for, 659
- differential test for, 2115
- Chlorine-ammonia treatment; *see* Chloramination
- Chrysophyceae; as indicators of clean water, 1104
- Cincinnati; cement-mortar lining of large cast-iron main at, 1693
- water supply of, 1199
- Civil service; adequate; values of, 1591
- experiences with, in Canada, 1609
- limitations of, 1596
- Cleveland; sewer rental experiences in, 1923
- Coagulation; effect on, of turbidity, 911
- experiments on, at Wichita, 1235

SUBJECTS

- pre-chlorination as an aid to, 250
 Coatings; *see also* Linings
 bituminous; mechanical application of, 1723
 spun; equipment used for, 1746
 steel pipe; specifications for, list of, prepared by Committee 7A, 1716
 tank; materials for, experimental studies on, 1553
 Codes; plumbing; standardization of, 1577
 Coefficients; *see* Hydraulics
 Coliform organisms; *see* Bacteria
 Collection; *see also* Billing
 delinquent account; effect of joint water and sewer account administration on, 1921
 practices of, in U. S. cities, 1373
 legal measures for, at Cincinnati, 1215
 joint water and sewer account, report on, 1911
 Colorado River; softened water of, use of, for home gardens, 883
 Committee reports; *see* American Water Works Association
 Communication; radio; use of, in emergencies, 1166
 telephone; defense of, in Britain, 1446
 Conditioning; *see* Treatment
 Conduits; *see* Pipe, Transmission systems
 Conferences; *see* Short schools
 Connecticut; utility co-ordination for defense in, 1083
 Conservation; *see* Erosion, Reforestation
 Construction projects; *see* program for, as a factor in good management, 1162
 temporary; civil service in, limitations of, 1597
 Contamination; *see also* Pollution
 bacterial and poison gas; methods of combating, in Britain, 1443
 Control; automatic; application of, to ozonation equipment, 2043
 devices for, in Tacoma, Wash., 1188
 use of, at Toronto's new plants, 1018
 laboratory; adequacy of present methods of, 2051
 standardization of, difficulty of, 1815
 well supply; methods of, at Wichita, 1234
 Copper sulfate; *see* Treatment
 Corrosion; *see also* Cathodic protection, Coatings, Linings, Painting
 bacterial; iron and steel affected by, 147
 control of; at Orange, Va., 299
 at Richardson, N. D., 293
 by pH correction, 286
 studies in, 1409
 current problems in, 903
 fundamentals of, 1249
 inhibition of; by painting, 309
 water conditioning methods for, committee report on, 1534
 lead; inhibition of, with sodium hexametaphosphate, 1179
 nature and mechanism of, 302
 Couplings; sleeve type; emergency distribution system repairs with, 1790
Crenothrix; control of, by super-chlorination, 168
 Creston, Iowa; failure and rehabilitation of water supply of, 953
 Cross-connections; pollution of water supply through, at Rochester, N. Y., 1334
 prevention of, 1572
 protection of; legal aspects of, 495
 practical aspects of, 391
 Cryptophyceae; as indicators of clean water, 1100
 Customer relations; *see* Public relations
- D**
- De-chlorination; *see* Chlorination
 Defense; *see also* Emergencies, Priorities
 civil; limitations of, 1479
 local council for, at Gloversville, N. Y., 1869
 organization for, 130
 relation of individual to, 1307
 rôle of public water supply in, 121
 utility co-ordination for, 1079
 utility service; experiences in, in Britain, 1440
 water works; auxiliary supply for, in Westchester County, N. Y., 680
 county health departments in, 702
 FBI activity in, 1861
 information on, *immediately following Abstract Section in July, August, September and November issues*
 inter-connection of transmission systems for, in New Jersey, 1523

- methods of, in New Jersey, 1517
 pollution prevention in distribution
 systems after air raid damage,
 in Britain, 1117
 problems of, 1475
 protection of New York City water
 system in, 1689
 protective lighting in, 671
 sabotage prevention in, 123
 special considerations in, 1866
 Delinquency; *see* Collection
 Denver, Colo.; policy on special rates
 and free water in, 1634
 water works finance and accounting
 methods at, 1648
 Depreciation; *see* Accounting
 Des Moines, Iowa; group insurance in,
 1496
 policy on special rates and free water
 in, 1635
 Detroit, Mich.; joint administration of
 water and sewer accounts in, 1917,
 1926
 Disease; amebic dysentery; causative
 organism of, viability and destruc-
 tion of, 1705
 gastro-enteritis; epidemic of, in a large
 office group, 1263
 isolation of causative organisms of,
 1430
 water-borne; incidence of, in U. S. and
 Canada in 1940, data on, 2051
 Disinfection; *see* Chlorination, Mains,
 Sterilization
 Dissolved oxygen; *see* Oxygen
 Distribution systems; *see also* Mains,
 Pipes, Services, Tanks, Valves
 ammonia residual in, 2095
 automatic controls in, at Syracuse,
 N. Y., 873
 auxiliary; design of, for emergency
 service and defense, 680
 provision of, for fire protection, 972
 back-flow and back-siphonage through
 cross-connection and inter-connec-
 tions in, 391, 495
 calcium carbonate deposition in, inhi-
 bition of, with sodium hexameta-
 phosphate, 1239
 cathodic protection of, *see* Cathodic
 protection
 control in, *see* Control
 corrosion in, *see* Corrosion
 defense measures in, *see* Defense
 developments in, during past 25 years,
 732
 effect of changes in treatment on, 1536
 effect of sodium hexametaphosphate
 on, 1537
 elevation of, relation of meter rates to,
 1655
 emergency repairs to, equipment avail-
 able for, 1779
 extensions to; costs of, 749, 1053
 effect of population trends on, 827
 financing of, 219, 1041
 regulation of, in New York and New
 Jersey, 1048
 survey of policies on, in U. S., 1357
 features of, at Cincinnati, 1210
 flow analysis in, *see* Hydraulics
 improvements to, in Creston, Iowa,
 959
 insurance requirements for, 1058
 maintenance of, *see* Maintenance
 pollution in; prevention of, in Britain,
 1116
 through cross-connection with fire
 system, at Rochester, N. Y.,
 1334
 pressure in, increase of, by additional
 storage, 861
 protection of, for New York City, 689
 underground structures in, cathodic
 protection of, 305
 Districts; metropolitan; application of,
 to water supply problems in metro-
 politan areas, 1886
 utility; management problems of, 1897
 Dual systems; *see* Cross-connections
 Duluth, Minn.; policy on special rates
 and free water in, 1630
 Duplicate facilities; *see* Distribution sys-
 tems, Supplies
 Dysentery; *see* Disease
- ## E
- East Bay Municipal Utility District; de-
 velopment of, 1894, 1897
 management problems of, 1897
 pipe laying costs of, 749
 Edison Electric Institute; opinion of, on
 special rates to federal housing pro-
 jects, 1642
 Electric utilities; defense of, in Britain,
 1446

Electricity; *see* Power
 Electrolysis; fundamentals of, 1259
 leaks caused by; combating of, with
 cement-mortar lining at Akron,
 Ohio, 1671, 1698
 Elevation; relation of meter rates to,
 1655
 Elk River; pollution survey of, 1093
 Embankments; earth; lining of, with
 road oil, for storage reservoirs, 876
 Emergencies; *see also* Defense
 chlorination equipment available for
 use in, 1319, 1327, 1344
 distribution system repair in, equip-
 ment available for, 1779
 use of radio communication in, 1166
 Enamel; coal-tar; *see* Coatings, Linings
Endameba histolytica; cysts of, viability
 and destruction of, 1705
 Erosion; control of, to prevent silting in
 reservoirs, 1035
 Experimental work; *see* Research work
 Extensions; *see* Distribution systems

F

FBI; *see* U. S. Federal Bureau of Investi-
 gation
 F.C.C.; *see* U. S. Federal Communica-
 tions Commission
 Federal control; *see* Regulation
 Feed water; studies on, by joint research
 committee, 1402
 Filters; charcoal; taste and odor control
 by, 2125
 gravel for; methods of handling, at
 Indianapolis, 1221
 maintenance and operation of, at
 Wichita, 1238
 materials for; abstracts of studies on,
 2025
 specifications for, progress in prepa-
 ration of, 2021
 rapid sand; clogging of, 926
 sand for; methods of handling, at Indi-
 anapolis, 1221
 testing of, 2023, 2025
 washing of; methods for, 1221
 surface agitator for, at Indianapolis,
 1228
 Filtration; combination of, with lime
 treatment, for iron and manganese
 removal, 1939
 equipment for, at new Toronto plant,
 1014
 methods of, used in West Virginia, 948
 new plant for, at Cincinnati, 1206
 sand; combination of, with coke con-
 tact aeration for iron removal,
 1935
 surface water; bacterial quality of
 water from small plants using, 913
 Financing; extensions; methods of, in
 U. S. cities, 219, 1041, 1357
 investment; increase of, by extensions
 to distribution systems, 1044
 methods of; in Denver municipal water
 works, 1648
 in East Bay Municipal Utility Dis-
 trict, 1899
 in Madison, Wis., 101
 relation of, to meter rates, 1661
 water revenue bond; effect of free
 water on, 1635
 Fire hydrants; *see* Hydrants
 Fire protection; auxiliary supplies for,
 972
 charges for; *see also* Rates
 in Canada, 1395
 consideration of, in insurance sched-
 ules, 1058
 Fire trucks; use of, in emergency disin-
 fection, at Rochester, N. Y., 1344
 Fittings; steel pipe; hydrostatic testing
 of, 1761
 standard types of, 1753
 Flanges; steel pipe; standards for, 1753
 Floc; effect of size of, on clogging of rapid
 sand filters, 930
 Flocculation; current problems in, 908
 Floodlighting; use of, in defense of water
 works property, 671
 Floods; control of, on Willamette River,
 through Army Engineer project, 721
 forecasting of; organization of service
 for, in Pennsylvania, 213
 progress in, during past 25 years, 734
 Flow; analysis of, *see* Hydraulics
 distribution system; control of, by
 automatic devices, 1193
 Fluorides; determination of; acetylace-
 tone method, using the photronic
 colorimeter, 1981
 correction for interfering ions in,
 2210
 distillation and titration methods
 for, 1975

ferrie thiocyanate method for, 1979
 methods of, 1965
 modification of standard method for,
 1971, 1973, 1974, 1975, 1982, 2018,
 2210
 Flushers; street; use of, in emergency
 disinfection at Rochester, N. Y.,
 1344
 Forecasting; flood; *see* Floods
 Fort Dodge, Iowa; policy on special rates
 and free water in, 1631
 Free water; *see* Rates, special
 Friction; pipe; capacity loss from, reduc-
 tion of, by chlorine-ammonia treat-
 ment, 2103
 Frontage charges; use of, for financing
 extensions in Los Angeles, 221
 Funds; *see also* Financing
 allocation of, Wisconsin law on, 98
 surplus; use of, in Canada, 1399

G

Gages; recording; automatic; use of, in
 Tacoma, Wash., 1195
 Gardens; *see* Irrigation
 Gas; poison; contamination by, methods
 of combating, in Britain, 1443
 utilities; defense of, in Britain, 1444
 opinion of, on special rates to federal
 housing projects, 1641
 Gastro-enteritis; *see* Disease
 Gates; sluice; *see* Sluice gates
 Geology; consideration of, in preparing
 well drilling code, 140
 ground water; in the Houston area,
 1768
 Germicidal efficiency; of chloramine,
 2098
 Gloversville, N. Y.; national defense
 council at, 1869
 Golden Gate Exposition; *see* Treasure
 Island
 Government control; *see* Regulation
 Grading; lowering cast-iron mains under
 pressure in, 764
 water quality; application of, to drink-
 ing water standards, 1827, 2215
 schedules for, need for, in Canada,
 1400
 Gravel; *see* Filters
 Greenville, S. C.; policy on special rates
 and free water in, 1631

Ground water; *see also* Wells
 iron in, in Western Pennsylvania, 1929
 use of, to supply Houston, Tex., 1769
 Grounding; electric; effect of, on water
 pipes, program for research on, 1541
 Gunite; *see* Cement

H

Hardness; relative values of, of Canadian
 water supplies, 967
 Hardy Cross method; *see* Hydraulics
 Head loss; *see* Hydraulics
 Health; *see also* Disease
 benefits to, from control of well drill-
 ing, 138
 departments; county; rôle of, in de-
 fense of water supplies, 702
 protection of, through cross-connec-
 tion, inter-connection and back-
 flow control, 391, 495
 Hexametaphosphate; *see* Sodium hexa-
 metaphosphate
 Highland Park, Mich.; corrosion control
 by pH correction at, 286
 Hobart, Ind.; costs of extensions to dis-
 tribution systems beyond corporate
 limits in, 1053
 Housing; *see* U. S. Housing Authority
 Houston, Tex.; water supply of, develop-
 ment of, 1768
 Hydrants; spacing of, insurance require-
 ments for, 1067
 Hydraulics; coefficients; comparison of,
 75
 trends in application of, to large pipe
 lines, 1
 flow analysis; computation of equiva-
 lent lengths of parallel pipe sys-
 tems in, 237
 Hardy Cross method of; application
 of, to distribution system prob-
 lems, 224
 modifications to, 234
 results of, on cement-mortar-lined
 mains, 1687, 1694, 1699, 1703
 formulas; comparison of, 60
 Mills; diagram and table for use of,
 76
 modernization of, 3
 pipe line; history of, 1
 Hydrographs; unit; flood forecasting in
 Pennsylvania by, 215
 Hypochlorite; *see* Calcium, Chlorination

SUBJECTS

I

- Ice; difficulties with, in cathodic protection of tanks, 1508
- Indiana; district and short schools in, 618
- Section; *see* American Water Works Association
- utility co-ordination for defense in, 1079
- Indianapolis; annexation practice in, 1893
- methods of handling sand and gravel at, 1221
- plankton control methods at, 2108
- water works motion pictures in, 208
- Inspection; insurance; value of, in maintenance of service, 2192
- Insurance; machinery; inspection service and types of coverage offered for, 2192
- Inter-connections; plumbing; prevention of, 1572
- protection of; legal aspects of, 495
- practical aspects of, 391
- transmission system; development of, as a defense measure, in New Jersey, 1523
- Investment; *see* Financing
- Iowa; group insurance practices in, 1496
- Iron; *see also* Pipe, Services, Mains
- bacterial corrosion of, 147
- removal of; *see also* Softening
- in Western Pennsylvania water supplies, 1929
- Irrigation; benefits to, of Willamette Valley Project, 721
- effect of, on soil solution, 885
- gardens; use of softened Colorado River water for, 883
- water for; effect of salinity in, 885
- furnished by mutual water companies, in Southern California, 894

J

Joints; *see* Pipe

K

- Kanawha River; pollution survey of, 1087
- Kentucky; electric power for water pumping plants in, 844

L

- Laboratory; control; adequacy of present methods of, 2051
- equipment; depth sampler; design of, 2207
- mobile; design of, for use of Ohio River Pollution Survey, 636
- design of, for use of Oregon State Board of Health, 644
- technic; standards for, revision of, objections to, 1813, 2215
- water analysis; organization of, by state in Venezuela, 277
- Lactose broth; *see* Media
- Law; application of; to collections, at Cincinnati, 1215
- to cross-connection, inter-connection and back-flow protection, 495
- to special utility rates, 1644
- civil service; need for flexibility in, 1604
- group insurance; present status of, in Iowa, 1496
- social security; application of, to water works employees, 1489
- Laying; *see* Pipe
- Lead; *see also* Pipe, Services
- pick-up of, in services, inhibition of, by sodium hexametaphosphate, 1179
- solution of, by metaphosphates, 1538
- Leaks; prevention of, caused by electrolytic action, with cement-mortar lining at Akron, Ohio, 1671, 1698
- Legislation; *see* Law
- Liability; *see* Law
- Licensing; *see* Personnel
- Lighting; protective; use of, in defense of water works property, 671
- Lime; recovery of, from sludges produced in softening, 741
- treatment with, combination of, with filtration, for iron and manganese removal, 1939
- Linings; *see also* Coatings
- bituminous enamel; effect of, on pipe line coefficients, 13, 55
- mechanical application of, 1723, 1763
- spun; equipment used for, 1733, 1763
- cement; development of, 1695
- cement-mortar; centrifugal method; application of, 1697, 1702

- specifications for, 1690
 use of, on large cast-iron main at Cincinnati, 1693
 use of, on steel force mains at Akron, Ohio, 1671
 use of, on steel trunk mains at Toledo, Ohio, 1682
 Tate process; application of, 1697, 1702
 concrete; effect of, on pipe line coefficients, 16, 55
 Little Rock, Ark.; reduction of pipe friction losses with chloramine treatment at, 2103
 Los Angeles; cement jointing in distribution system of, 769
 civil service in, limitations of, 1596
 defense organization in, 131
 emergency radio communication in, 1173
 financing of extensions in, 219
 soils of, effect of irrigation on, 888
 special rates and free water in, policy on, 1636
 Louisville, Ky.; special rates and free water in, policy on, 1629

M

- Machinery; insurance of, inspection service and types of coverage offered for, 2192
 Madison, Wis.; effective management in, under municipal ownership, 99
 Mains; *see also* Distribution systems, Pipes, Services
 carrying capacity of, maintenance of, ineffectiveness of cleaning for, 1700
 cast-iron; lowering of, under pressure, 764
 cleaning of; in preparation for cement-mortar lining, 1675, 1682, 1693
 in preparation for lining with coal-tar enamel, 1764
 ineffectiveness of, in maintaining carrying capacities, 1700
 restoration of capacity by, at Manasquan, N. J., 755
 coating of, *see* Coatings
 connection of; temporary; in emergency repairs, 1786
 couplings for; sleeve type; use of, in emergency repairs, 1790
 disinfection of; importance of, after repairs, 771
 fractured; experiences with, in Britain, 1442
 lining of; *see* Linings
 Maintenance; automotive equipment for, costs of, 1362
 department; accounting practices of, in Denver, 1651
 distribution system; emergency; equipment available for, 1779
 pollution prevention in, after air raid damage, in Britain, 1117
 program for, at Cincinnati, 1211
 meter; practices of, in U. S. and Canadian cities, 1381
 problems of, in defense, 693
 Management; *see also* Administration, Public relations
 effectiveness of, under municipal ownership, 97
 efficiency in, effect of relations of superintendent and elected official on, 84
 factors in, 1161
 mutual water company; problems of, 894
 utility district; problems of, 1897
 Manasquan, N. J.; cleaning of mains at, 755
 Manganese; removal of, from Pennsylvania water supplies, 1931
 zeolite; iron and manganese removal with, 1937
 Media; brilliant green bile and lactose broth; comparison of, 649
 Metals; comparative corrosive attacks on, by various waters, 1409
 concentration of, analysis of, polarographic method for, 1544
 protection of, by painting, 309
 Metaphosphate; *see* Sodium hexameta-phosphate
 Metering; program for, at Scottsburg, Ind., 1218
 Meters; cold water; displacement type; tentative specifications for, *a section of the December issue*
 maintenance of, practices in, in U. S. and Canadian cities, 1381
 rates based on; *see* Rates
 reading of; costs of, in U. S. cities, 1373
 procedure of, for a group of small plants, 2201
 settings for; outside and inside; comparison of, 1666

- testing of; practices in, in U. S. and Canadian cities, 1381
 use of, in Canada, 1391
 Metropolitan areas; water supply problems of, 1880
 Metropolitan districts; *see* Districts
 Metropolitan Life Insurance Co.; San Francisco office of, gastro-enteritis epidemic in, 1263
 Miami, Fla.; special rates and free water in, policy on, 1630
Microspira desulfuricans; characteristics of and corrosion by, 147
 Minneapolis; joint administration of water and sewer accounts in, 1916
 lime recovery from water softening sludges in, 741
 maintaining efficiency of centrifugal pumps in, 849
 Montana; short schools in, 616
 Motion pictures; water works; specifications for construction of, 202
 use of, for publicity, 201
 Municipal Finance Officers Association; opinion of, on special utility rates to federal housing projects, 1643
 Mutual water companies; problems of, 894

N

- Nassau County, N. Y.; health department defense measures in, 701
 National Board of Fire Underwriters; developments in fire protection by, 974
 National Plumbing Laboratory; work of, 1569
 Navigation; benefits to, through Willamette Valley Project, 721
 capability of, decision of Supreme Court on, of New River, 315
 New Jersey; effect of population trends on water supply in, 829
 northern; hydraulics of large pipe lines for supply of, 1
 water supply defense in, 1517
 New Orleans; special rates and free water in, policy on, 1632
 New River; decision of Supreme Court on navigability of, 315
 dissenting opinion of Supreme Court on navigability of, 338
 New York City; defense measures for water system of, 689
 water system of, 690

- New York Water Service Corp.; billing procedure of, 2201
 Newark, N. J.; hydraulics of large pipe lines for supply of, 1
 Nitrates; determination of, by modification of the phenoldisulfonic acid method, 1589
 Nitrite nitrogen; *see* Nitrogen
 Nitrogen; ammonia; determination of, 2113
 natural; relationship of, to formation of chloramines, 2095
 nitrite; determination of, 2115
 Norfolk, Va.; loss of chlorine-ammonia residuals through aerators at, 2097
 Nose; efficacy of, in determining threshold odor values, 1956

O

- Odors; *see* Tastes and odors
 Ohio; reforestation of water works properties in, 1175
 Ohio River Pollution Survey; *see* U. S. Public Health Service
 Oil; road; lining earth reservoir embankments with, 876
 Olfactory membrane; efficacy of, in determining threshold odor values, 1956
 Operation; normal; civil service in, limitations of, 1601
 problems in, at Wichita, 1233
 recording of, automatic devices for, 1195
 standardization of, difficulty of, 1815
 Operators; *see also* Personnel
 contribution to, by salesmen, 1076
 demands by, of salesmen, 1069
 Orange, Va.; control of corrosion at, 299
 Ordinances; *see also* Regulation
 model; re: cross-connection, inter-connection and back-flow protection, 571
 quotations from, of various U. S. cities, on cross-connection, inter-connection and back-flow protection, 458
 Oregon; State Board of Health; mobile laboratory units of, 644
 Willamette River Valley Project; relation of, to water supply, 721
 Ottawa, Ill.; distribution system analysis in, by Hardy Cross method, 225
 Ottawa, Ont.; corrosion control studies at, 1409

- Oxygen; dissolved; determination of, nomograph for, 1111
Ozone; generation of, equipment for, 2037
taste and odor control by, 2132
treatment with; at Whiting, Ind., 2035
operation and cost data on, 2043

P

- Painting; preparation of surfaces for, 311
protection of metals by, 309
tank; materials for, experimental studies on, 1553
Papers; *see* Reports
Parkersburg, W. Va.; new method of cleaning wells in, 145
Pasadena, Calif.; construction of earth reservoir embankments with road oil linings at, 876
Pennsylvania; flood-forecasting service in, 213
Western; iron removal in water supplies of, 1929
Pequannock pipe lines; history and hydraulics of, 4
Personnel; *see also* Civil service, Operators, Short schools
appointed and elected, relation between, 84
certification of, plan for, in Tennessee, 625
status of, listed by states, 631
defense measures in choice of, 123
experienced; need for, in defense of water supplies, 703
group insurance for, Iowa practice in, 1496
licensing of, status of, listed by states, 631
loyalty of, importance of, to defense, 1477, 1863
management of; problems in, 1592
part of, in public relations, 1482
position of, developments in, during past 25 years, 739
raising standards of, 95
relations; in East Bay Municipal Utility District, 1908
repair crew; type of, for defense of New York City water system, 699
retirement of; organization for, in East Bay Municipal Utility District, 1908
planning for, 1489
selection of; at Wichita, 1233
various methods for, 84
social security for; application of present and proposed laws to, 1489
training of, for emergency chlorination work, 1320
pH; correction of; for control of corrosion, 286
effect of, on destruction of cysts of *Endameba histolytica*, 1713
raising of, to correct corrosive water, 295
Phenoldisulfonic acid method; modification of, for determination of nitrates, 1589
Phosphate; commercial; feeding of, to correct corrosive water, 295
Photo-electric cell; use of, in colorimeter, 660
Pipe; *see also* Distribution systems, Mains, Services, Transmission systems
capacity; effect of chlorine-ammonia treatment on, 2102, 2103
cast-iron; developments in, during past 25 years, 737
coating of; *see* Coatings
corrosion of; *see* Corrosion
electric grounding of; effect of, program for research on, 1541
friction losses in, reduction of, by chlorine-ammonia treatment, 2103
joints in; asbestos rope for, 772
cement for, for improved water quality, 769
mechanical; use of in emergency repairs, 1800
necessity for sterilizing, 769
repair equipment for, 1790
large; hydraulics of, trends in, 1
laying of; costs of, in East Bay Municipal Utility District, 749
pollution prevention in, in Britain, 1119
lining of; *see* Linings
parallel systems of, computation of equivalent lengths in, 237
steel; cleaning of, in preparation for bituminous lining, 1725, 1733
fittings and specials for, 1751
priming of, in preparation for bituminous lining, 1725, 1736
reducers for, use of, in emergency repairs, 1797

SUBJECT

SUBJECTS

- specifications for, list of, prepared by Committee 7A, 1716
- Plankton; *see* Algae
- Plumbing; *see also* Back-flow, Cross-connections, Inter-connections
 fixtures; standardization of, 1565
 protection of, against back-flow and back-siphonage, 391, 495 -
 terminology of, problems of, 1566
- Polarographic method; use of, in grounding research program, 1548
- Pollution; *see also* Contamination
 distribution system; *see* Distribution systems
 lake; ozonation to overcome, 2035
 stream; recent studies of, in West Virginia, 1085
 two groups of flagellated algae as indicators of, 1100
- Population; relation of meter rates to, 1653
 relation of, to water supply, 827
 urban; changing concentrations of, in U. S., effect of, on water supply, 1876
- Potassium permanganate; taste and odor control by, 2132
- Power; electric; grounding of, on water pipe, effect of, program for research on, 1541
 portable sources of, use of, in emergency distribution system repairs, 1781
 proposed development of, in Willamette Valley Project, 721
 use of, in pumping plants, 844
 utilities; opinion of, on special rates to federal housing projects, 1642
- plants; machinery of; insurance of, inspection service and types of coverage offered for, 2192
- Pre-chlorination; *see* Chlorination
- Pressure; atmospheric; corrections for, in dissolved oxygen determinations, 1114
 distribution system; control of, by automatic devices, 1193
- Priorities; information on; *immediately following Abstract Section in July, August, September and November issues*
- Preference Rating Order P-46, 1854
 problem of, in defense program, 1476
- Protection; *see* Defense
- Public relations; development of, in gaining acceptance of meterization program at Scottsburg, Ind., 1219
 motion pictures in, 201
 practices in, in East Bay Municipal Utility District, 1905
 present state of, 91
 relation of A.W.W.A. to, 93
 scientific approach to, 1481
- Publication; writing for, criteria for, 1500
- Publicity; *see* Public relations
- Pumping; facilities for, at Cincinnati, 1201
 interruptions in, prevention of, at Buffalo, 1586
- Pumps; centrifugal; performance of, 837
 testing techniques for, 850
 developments in, during past 25 years, 735
 electric power for, 844
 portable; use of, in emergency distribution system repairs, 1779
 selection of, factors in, for small water works, 853
 various types of, at new Toronto plant, 1014
- Purification; *see also* Treatment
 equipment for, at Toronto, 1011
 ozone for, at Whiting, Ind., 2035
 stream; flow augmentation for, through Willamette Valley Project, 721

Q

- Quality; bacterial; distribution system investigation of, 1429
 Treasury standard of, lack of compliance with, of small filtration plants treating surface water, 913
 proposed changes in, 1805, 1826, 2215
 characteristics of, for various waters supplying northern New Jersey, 51
 chemical; Treasury standard requirements in, proposed changes in, 1806, 2215
 improvement in, by use of cement joints, 769
 indicators of, two groups of flagellated algae as, 1099

physical; Treasury standard requirements in, proposed changes in, 1806, 2215

Treasury Drinking Water Standard; amendment of test portions recommended for, 1242.
contemplated revision of, 609, 1804, 2215

R

Racine, Wis.; development of photoelectric method of residual chlorine determination at, 659

Radio; emergency communication by, 1166

Rantoul, Ill.; distribution system analysis in, by Hardy Cross method, 231

Rates; domestic; Canadian practices in, 1390

fire protection; Canadian practices in, 1395

meter; relation of, to distribution system conditions, 1653
variation in, factors in, 1653

municipal service; Canadian practices in, 1395

practices in, in East Bay Municipal Utility District, 1904

schedules for, design of, as a factor in good management, 1162

sewer rental; adjustments to, in special cases, 1918

structure of, 1915

special; application of, on all utilities, to federal housing projects, 1638

Canadian practice on, 1400

experiences with, in various U. S. cities, 1629

legal aspects of, 1644

problem of, 1627

Rating; *see* Grading

Raw water; need for standards for, 1809

Records; *see also* Accounting
importance of, to good management, 1164

Reducers; steel; use of, in emergency distribution system repairs, 1797

Reforestation; conservation of Ohio water works properties by, 1175

Regional supplies; *see* Supply

Regulations; *see also* Ordinances

government; of public water supplies, limitations of, 1816

Rental; sewer; *see* Rates

Repair; *see* Maintenance

Reports; preparation of, criteria for, 1500

Research work; critical appraisal of, 1497
reporting of, criteria for, 1500

Reservoirs; depth sampling in, apparatus for, 2207

impounding; control of algae in, by copper sulfate, 705

increasing capacity of, in Creston Iowa, 957

multiple use of, on Willamette Valley Project, 721

silting in, control of, 1022

storage; earth embankments of, lining of, with road oil, 876

new design of, at Syracuse, N. Y., 861

Residual chlorine; *see* Chlorine

Retirement; personnel, *see* Personnel

Richardton, N. D.; corrosion experience at, 293

Richmond, Va.; annexation of suburban areas by, 1881

preparation of water for filtration by super-chlorination and de-chlorination at, 249

Rivers; navigability of, *see* Navigation

Rochester, N. Y.; pollution and emergency disinfection of water supply at, 1334

Rockaway conduits; history and hydraulics of, 27

S

Sabotage; *see* Defense

St. Paul, Minn.; joint administration of water and sewer accounts in, 1917

Salesmen; contributions by, to operators, 1076

demands on, by operators, 1069

Salinity; irrigation water; effect of, on soil and plants, 885

Sampling; depth; apparatus for, in streams and reservoirs, 2207

methods of, for water analysis in Venezuela, 281

standardization in; for fluoride determinations, 1969

need for, 1814, 1822, 2215

San Francisco; emergency chlorination equipment at, 1327

gastro-enteritis epidemic in, 1263

World's Fair; *see* Treasure Island

SUBJECTS

- Sand; *see* Filters
- Schools; *see* Short schools
- Scioto River; pollution of, determination of, by use of two groups of flagellated algae, 1100
- Scottsburg, Ind.; 100 per cent meterization program at, 1218
- Sedimentation; control of, to prevent silting in reservoirs, 1035
- Service; customer; *see* Public relations
- pumping station; interruptions to, prevention of, 1586
- Services; *see also* Distribution systems, Pipe
- lead; corrosion of, inhibition of, with sodium hexametaphosphate, 1179
- Settings; meter; *see* Meters
- Sewage works; defense of, in Britain, 1444
- Sewers; service charges for, joint collection of, with water bill, 1911
- Short schools; courses for, 620
- experience with, in Montana, 616
- faculty problems of, 614
- report on, in Indiana, 618
- theory of, 611
- Silica; influence of; on corrosion, 906
- on flocculation, 909
- Silting; reservoir; control of, factors in, 1022
- Sludge; water softening; lime recovery from, 741
- Sluice gates; tentative standard specifications for, *immediately following page 1860*
- Soap cost; effect of softening on, 111
- effect of zeolite softening on, in South Orange, N. J., 275
- Social security; *see* Personnel
- Soda ash; feeding of, to correct corrosive water, 295
- Sodium; diethyldithiocarbamate; use of, in rapid determination of zinc, 246
- hexametaphosphate; effect of, on distribution systems, 1537
- inhibition of lead corrosion with, 1179
- solution of lead by, 1538
- stabilization of water with, at Wichita, 1238
- zeolite; iron and manganese removal with, 1931
- Softening; census of municipal plants using, 2153
- effect of, on irrigation water, 883
- iron removal combined with, in Western Pennsylvania supplies, 1930
- lime and lime-soda; iron and manganese removal in, 1941
- lime recovery from sludge produced in, 741
- municipal and household; comparative costs of, 116
- present status of, in Wisconsin, 114
- zeolite; cost of, 261
- use of, at South Orange, N. J., 255
- Soil Conservation Service; *see* U. S. Department of Agriculture
- Soil solution; effect of irrigation on, 885
- Solids; percentage of, determination of, in water softening sludges, 747
- removal of, rate of, at different layers in filters, 934
- South Orange, N. J.; zeolite softening in, 255
- Southern California; *see* California
- Specials; steel pipe; various types of, 1754
- Specifications; *see also* American Water Works Association
- filtering material; progress in preparation of, 2021
- plumbing, 1575
- pump; factors in drawing up, for small water works, 853
- steel pipe and coatings; list of, prepared by Committee 7A, 1716
- Standards; drinking water; *see* Quality
- plumbing; progress in development of, 1565
- Steel; *see also* Pipe, Services, Mains, Tanks
- bacterial corrosion of, 147
- protection of; coating materials for, 1553
- Sterilization; *see also* Chloramination
- Chlorination
- early studies in, 2127
- importance of, of new or repaired mains, 771
- present practices in, in Britain, 1116, 1443
- Suburban areas; *see also* Metropolitan areas
- meter rates in, 1660
- Sulfide; measurement of, in low concentrations, 943

Sulfur; dioxide; de-chlorination with, at Richmond, Va., 253
oxidation of, corrosion of iron and steel caused by, 158
Super-chlorination; *see* Chlorination
Supply; auxiliary; development of, for emergency service and defense, 680
provision of, for fire protection, 972
development of, in West Virginia, 948
emergency sources of, use of, in defense, 1867
failure of, during drought, in Creston, Iowa, 953
ground water; use of, in Houston, Tex., 1769
improvements to, in Creston, Iowa, 957
investigation of, in Canada, 967
protection of, for New York City, 689
proximity of, relation of, to meter rates, 1660
regional; recent trends in, 1875
relation of population trends to, 827, 1875
small; application of drinking water standards to, 1808
Supreme Court; *see* U. S. Supreme Court
Surpluses; *see* Funds
Syracuse, N. Y.; new type storage reservoir at, 861

T

Tacoma, Wash.; water system of, automatic recording and control devices in, 1188
Tanks; *see also* Distribution systems
cathodic protection of, *see* Cathodic protection
cleaning of, methods for, 1555
coatings for, *see* Coatings
corrosion of, *see* Corrosion
steel; circular; combination of three, in new storage reservoir at Syracuse, N. Y., 863
Tastes and odors; control of; *see also* Chloramination, Chlorination, Treatment
bibliography of, 2144
effectiveness of chloramines in, 2097, 2137
history of, 2124
super-chlorination as a means of, 168
detection of; by consumers, 1959

efficacy of olfactory membrane in, 1956
evaluation of; methods of, history of, 2143
threshold odor method of; accuracy of, 1945
history of, 2143
short-parallel modification of, 1960
twilight zone modification of, 1949
occurrence of, in Kanawha and Elk Rivers, 1087
twilight zone of, measurement of, 1961
Tate process; *see* Lining; cement mortar
Taxes; burden of, on mutual water companies, 898
Telephone; *see* Communication
Temperature; effect of, on algae growth and control in impounding reservoirs, 707, 717
water; effect of, on corrosive attack by various waters, 1419
Tennessee; certification of operators in, 625
Thiobacilli; corrosion of iron and steel by, 158
Threshold odor method; *see* Tastes and odors; evaluation of
Toledo, Ohio; cement-mortar lining of steel trunk mains at, 1682
Toronto, Ont.; new purification plant and pumping station at, 1011
Trailer laboratory; *see* Laboratory, mobile
Transmission systems; *see also* Pipe
developments in, during past 25 years, 734
inter-connection of, for protection of supply, in New Jersey, 1523
protection of, for New York City supply, 689
Treasure Island; emergency chlorination at, 1332
Treasury Drinking Water Standard; *see* Quality
Treatment; *see also* Chloramination, Chlorination, Purification
changes in, effect of, on distribution systems, 1536
conditioning; methods of, to inhibit corrosion, committee report on, 1534
copper sulfate; algae control in im-

SUBJECTS

pounding reservoirs by, 705, 2108
 taste and odor control by, 2129
 laboratory control of, adequacy of
 present methods of, 1251
 ozone; installation of, at Whiting,
 Ind., 2035
 sodium hexametaphosphate; *see* So-
 dium hexametaphosphate
 Trucks; *see* Automotive equipment
 Tulsa, Okla.; special rates and free water
 in, policy on, 1629
 Turbidity; effect of, on coagulation, 911
 Twilight zone; *see* Tastes and odors
 Typhoid; *see* Disease

U

United States; Department of Agricul-
 ture; Soil Conservation Service;
 work of, in control of reservoir silt-
 ing, 1024
 Federal Bureau of Investigation; work
 of, in water works defense, 1861
 Federal Communications Commission;
 rules of, re: emergency radio com-
 munication, 1167
 Housing Authority; utility service for
 projects of, special rates for, 1639
 Public Health Service; Ohio River
 Pollution Survey; mobile labora-
 tory units of, 636
 Scioto River pollution study by, 1100
 use of equipment of, in West Virginia
 pollution studies, 1086
 Supreme Court; decision of, on navi-
 gability of New River, 315
 dissenting opinion of, on navigabil-
 ity of New River, 338
 Unit hydrograph; flood forecasting by, in
 Pennsylvania, 215
 Urban areas; *see* Metropolitan areas

V

Vacuum breakers; protection of cross-
 connections and inter-connections
 with, 441
 Valves; control; automatic; use of, in
 Tacoma, Wash., 1193
 gate; use of, to protect pumping sta-
 tion against service interruptions,
 1586
 importance of, in defense of water
 supply works, 1441, 1478
 maintenance of, insurance require-
 ments for, 1066

protection of cross-connections and
 inter-connections by, 441
 Venezuela; state water analysis labora-
 tory in, 277

W

Wanaque aqueduct; history and hy-
 draulics of, 33
 War; *see* Defense
 Washing; filter; *see* Filters
 Washington, D. C., Suburban Sanitary
 District; development of, 1881
 Watersheds; recreational use of, de-
 velopments in, during past 25 years,
 734
 Wells; *see also* Ground Water
 capacity of, consideration of, in pre-
 paring drilling code, 140
 cleaning of, new method of, in Park-
 ersburg, W. Va., 145
 control of, at Wichita, 1234
 drilling of, control of, benefits to
 health and efficiency from, 138
 West Virginia; development of public
 water supplies in, 948
 recent stream pollution studies in,
 1085
 Westchester County, N. Y.; auxiliary
 supply for, 680
 Western Pennsylvania; *see* Pennsylvania
 Whiting, Ind.; ozonation at, 2035
 Wichita, Kan.; water system of, opera-
 tion problems in, 1233
 Willamette Valley Project; *see* Oregon
 Wisconsin; law in, on allocation of water
 works funds, 98
 probable effect of water softening in
 cities of, 103

Z

Zeolite; manganese; iron and manganese
 removal with, 1937
 natural; cost of softening by, compared
 with by synthetic, 256
 regeneration of, brine method for,
 use of, at South Orange, N. J., 267
 sodium; iron and manganese removal
 with, 1931
 synthetic; use of, for softening at
 South Orange, N. J., 259
 Zinc; determination of, rapid method for,
 in water supplies, 246

Author Index

- ALEXANDER, ED F., legal phases of Cincinnati water works operation, 1215
- ALEXANDER, L. J. AND EBAUGH, R. M., cement joints for improved water quality, 769
- ALFKE, CHARLES J., population trends and water supply, 827
- ALLAN, L. F., *see* SANDERSON, A. U.
- ALT, EDWARD E., what a salesman can offer an operator, 1076
- ANDERSON, E. D., costs of distribution system extensions beyond corporate limits in northern Indiana, 1053
- ARNOLD, G. E., experiences with emergency chlorinating equipment, 1327
- BAHLMAN, CLARENCE, new filtration plant at Cincinnati, 1206
- BARDWELL, R. C., *Vice-Chairman*, report of the Joint Research Committee on Boiler Feedwater Studies, 1402
- BARNARD, RUSSELL E., fittings and specials for steel pipe, 1751
- BARRON, J. L., health department defense measures in Nassau County, N. Y., 701
- BARTUSKA, JAMES F., ozonation at Whiting, Ind., 2035
- BAYLIS, JOHN R., water purification plants and water quality standards, 1824
- BECKWITH, T. D., bacterial corrosion of iron and steel, 147
- BERGMAN, LEONARD A., protection of Buffalo's pumping station against service interruption, 1586
- BERRY, A. E. AND STORRIE, WILLIAM, water rate structures in Canada, 1389
- BERRY, F. R., financial considerations of distribution system extensions, 1041
- BILLINGS, L. C., *discussion*—revising the U. S. standards for drinking water quality, 2221
- BLACK, A. P., *Chairman*, report of the Committee on Methods of Determining Fluorides, 1965
- BLACKBURN, DUNCAN A., construction of earth reservoir embankments with road oil linings, 876
- BLAKELEY, L. E., mutual water companies and domestic water, 894
- BLANKENSHIP, R. L., corrosion experience at Orange, Va., 299
- BOSCH, HERBERT AND WOLMAN, ABEL, bacteriological quality of water from small filtration plants treating surface waters, 913
- BROWN, CARL B., factors in control of reservoir silting, 1022
- BRUSH, WILLIAM W., twenty-five years advance in water works, 732
- BUCHANAN, E. V., discussion on civil service, 1609
- BURGESS, JOHN, centrifugal pump performance, 837
- BUSWELL, A. M., *discussion*—revising the U. S. standards for drinking water quality, 2219
- CALVERT, C. K., *discussion*—bacterial corrosion of iron and steel, 165
special section of committee report on chlorine-ammonia treatment, 2108
- CAPEN, CHARLES H., JR., trends in coefficients of large pressure pipes, 1; *erratum*, 364
relation of meter rates to distribution system conditions and other factors, 1653
- CARROLL, E. B., control of iron bacteria by super-chlorination, 168
- CARSON, H. Y., emergency repairs to distribution systems, 1800
- CHANG, S. L. AND FAIR, GORDON M., viability and destruction of the cysts of *Endameba histolytica*, 1705
- CHASE, E. SHERMAN, *discussion*—revising the U. S. standards for drinking water quality, 2223
- CHEVALIER, WILLARD, national defense and the individual, 1307
- CLARK, LLOYD K., corrosion experience at Richardton, N. D., 293

AUTHORS

- COLT, ROBERT M., national defense council at Gloversville, N. Y., 1869
- COWLES, M. W., progress in plumbing standardization, 1565
- COX, CHARLES R., drinking water standards, 1807
- CRABILL, M. P., methods of handling sand and gravel, 1221
- CRANE, HAROLD L., lowering cast-iron mains under pressure, 764
- CRIST, MARION L., special section of committee report on chlorine-ammonia treatment, 2103
- CRITCHLOW, H. T., water supply defense in New Jersey, 1517
- CROWLEY, A. B., *see* GEIGER, J. C.
- DAHLJELM, IRVING L., corrosion control by pH correction, 286
- DANDRIDGE, E. F., financing of extensions at Los Angeles, 219
- DEMARTINI, F. E., mobile laboratory units of the Ohio River Pollution Survey, 636
- DEVENDORF, EARL, pollution and emergency disinfection of Rochester's water supply, 1334; *erratum*, 1626
- DOLAND, J. J., flow and loss of head in distribution systems, 234
- DUHME, RALPH E., pumping plants at Cincinnati, 1201
- EBAUGH, R. M., *see* ALEXANDER, L. J.
- EBERLING, CARL A., history of Cincinnati water supply, 1201
cement lining of a water main at Cincinnati, 1693
- ELIASSEN, ROLF, clogging of rapid sand filters, 926
program for research on the effects of electric grounding on water pipes, 1541
- ELVOYE, ELIAS, *discussion*—methods of determining fluorides, 2210
- FABER, HARRY A., chlorination equipment for emergency use, 1319
literature survey for committee report on chlorine-ammonia treatment, 2080, 2121
- FAIR, GORDON M., *see* CHANG, S. L.
- FAIRMAN, F. I., electric power for water pumping plants, 844
- FARNSWORTH, GEORGE, JR. AND ROSANO, AUGUST, JR., application of the Hardy Cross method to distribution system problems, 224
- FARR, F., JR., *see* HOWLAND, W. E.
- FARRELL, LOUIS L., pipe laying costs of the East Bay Municipal Utility District, 749
- FEBEN, DOUGLAS, *see also* HULBERT, ROBERTS
discussion—accuracy of threshold odor values, 1956
- FINCH, LEWIS S., control of water well drilling, 138
- FITZGERALD, R. W., special section of committee report on chlorine-ammonia treatment, 2097
- FOOTE, H. B., water works schools, 611
notes on water works defense, 1867
- FRY, JAMES H., certification of operators in Tennessee, 625
- FUGATE, G. L., development of Houston's water supply, 1768
- GARRATT, JAMES E., *discussion*—population trends and water supply, 832
- GEIGER, J. C., CROWLEY, A. B. AND HYDE, C. G., gastro-enteritis epidemic in a large office group, 1263
- GERSTEIN, H. H., special section of committee report on chlorine-ammonia treatment, 2095
- GEUPEL, LOUIS A., utility co-ordination in emergencies, 1079
control of automotive equipment, 1362
- GIDLEY, H. K., development of public water supplies in West Virginia, 948
- GILCREAS, F. W., *Chairman*, report of the Committee on Chlorine-Ammonia Treatment of Water, 2079
- GLEDHILL, E. G. B. AND McCANLIS, A. W. H., pollution prevention in distribution systems in Britain, 1116
- GLEESON, G. W., fundamentals of corrosion, 1249
- GOIT, LAURANCE E., mechanical application of bituminous coatings and linings, 1723
- GOODHUE, R. F., insurance requirements for water works properties, 1058
- GOUDEY, R. F., practical aspects of cross-connection, inter-connection and back-flow protection, 391

- discussion*—methods of determining fluorides, 2213
- GRAHAM, A. F., machinery breakdown insurance, 2192
- GREEN, CARL E., Oregon mobile laboratory, 644
- GRIFFIN, A. E., special sections of committee report on chlorine-ammonia treatment, 2088, 2095, 2095, 2102, 2115
- HANSEN, PAUL, *Chairman*, progress report of the Committee on Specifications for Filtering Materials, 2021
- HARKNESS, BRUCE, cleaning and cement lining water mains in place, 1700
- HASSLER, JOHN W., *discussion*—accuracy of threshold odor values, 1958
- HASSLER, WILLIAM W., history of taste and odor control, 2124
- HATCH, G. B., inhibition of lead corrosion with sodium hexametaphosphate, 1179
- HATFIELD, W. D., nomograph for determining dissolved oxygen concentration in water, 1111
- HELBIG, W. A., *discussion*—accuracy of threshold odor values, 1963
- HICKEY, JOHN A., *discussion*—joint administration and collection of water and sewer accounts, 1923
- HIRSCH, A. A., *discussion*—revising the U. S. standards for drinking water quality, 2220
- HOCHLERNER, TOBIAS, defense measures for New York supply, 689
- HOFFMAN, M. F., commercial division of Cincinnati water department, 1214
- HOOVER, JOHN EDGAR, water supply facilities and national defense, 1861
- HOPPE, T. C., determination of nitrates in water by modification of the phenoldisulfonic method, 1589
- HOSKINS, J. K., some considerations in the revision of the Treasury standard, 1804
- discussion*—revising the U. S. standards for drinking water quality, 2218
- HOWARD, NORMAN J., defense of water supply works, 1475
- HOWLAND, W. E. AND FARR, F., JR., computation of equivalent lengths of parallel pipe systems, 246
- HOWSON, LOUIS R., what water softening would do for Wisconsin cities, 103
- management of water works, 1161
- discussion*—development of Houston's water supply, 1777
- HUDSON, H. E., JR., abstracts on filtering materials, 2025
- HUGHES, GEORGE F., finance and accounting of Denver's water system, 1648
- HULBERT, ROBERTS AND FEBEN, DOUGLAS, studies on the accuracy of threshold odor values, 1945
- HURLBUT, W. W., *discussion*—emergency radio communication, 1173
- current activities of the steel pipe committee, 1716
- HUTSON, A. C., auxiliary water supplies for fire protection, 972
- HYDE, C. G., *see* GEIGER, J. C.
- INGLEE, CLINTON, temporary make-ups and line caps, 1786
- JACKSON, J. O., experimental studies of tank coating materials, 1553
- JACKSON, L. A., survey of water main extension policies, 1357
- JONES, H. SEAVER, reconditioning water mains by cement lining, 1695
- JORDAN, HARRY E., public water supply in the civil defense program, 121
- KAMPS, J. M., cleaning and lining with bitumastic enamel, 1763
- KEITH, J. CLARK, experiences with cathodic protection of water tanks, 1503
- KERSHAW, NEIL, *discussion*—accuracy of threshold odor values, 1963
- KING, KENNETH K., meter reading and commercial department operation, 1373
- KLEINHENZ, JOHN E., *discussion*—how to make a motion picture of the water works, 208
- KUNIGK, W. A., automatic recording and control devices in Tacoma's water system, 1188
- KURANZ, A. P., survey of meter maintenance practice, 1381
- LACKEY, JAMES B., two groups of flagel-

- lated algae serving as indicators of clean water, 1099
- LA DUE, WENDELL R., cement lining of water mains at Akron, Ohio, 1671
- LATHROP, T. R., reforestation of Ohio water works properties, 1175
- LEE, JOHN C. H., relation of Willamette Valley Project to water supply, 721
- LENHARDT, L. G., *discussion*—special rates for federal housing developments, 1647
- LEVERIN, HARALD A., investigation of Canadian water supplies, 967; *errata notice*, 1160
- LIVERMORE, FRANK D., the water superintendent and the elected official, 84; *erratum*, 364
- LONGWELL, J. S., *discussion*—regional water supplies, 1894
- management problems of a municipal utility district, 1897
- LORDLEY, HOWARD E., *see* SMITH, MARSDEN C.
- MAFFITT, DALE L., social security legislation and retirement planning affecting water works employees, 1489
- special rates and free water service, 1627
- MAGISTAD, OSCAR C., use of softened Colorado River water for home gardens, 883
- MANGAN, JOHN W., flood-forecasting service in Pennsylvania, 213
- MCCANLIS, A. W. H., *see* GLEDHILL, E. G. B.
- MCCARTHY, JOHN J., Racine method of residual chlorine determination, 659
- MEACHAM, J. A., metal protective finishes, 309
- MELLETT, JOHN C., public relations begin at home, 1481
- MILLIGAN, T. E., *Chairman*, report of the Indiana Section Sub-Committee on Meter Settings, 1666
- MONIE, WILLIAM D., algae control, 705
- MONTILLON, G. H., corrosion and cathodic protection, 302
- MOORE, EDWARD W., *Chairman*, progress report of Committee on Water Conditioning Methods to Inhibit Corrosion, 1534
- MOORE, ROBERT E., JR., legal aspects of cross-connection, inter-connection and back-flow protection, 495
- MORGAN, L. S. AND YOUNG, C. H., iron removal in Western Pennsylvania water supplies, 1929
- MORSE, H. S., *discussion*—regional water supplies, 1893
- NALEFSKI, L. A., what an operator expects from a salesman, 1069
- NELSON, THURLOW C., *discussion*—algae control, 716
- NEWSOM, REEVES, statement re: depreciation, 359
- discussion*—population trends and water supply, 833
- NOBLE, RALPH E., testing larger portions of water for coliform bacteria, 1242
- discussion*—revising the U. S. standards for drinking water quality, 2224
- NORCOM, GEORGE D., revising the U. S. standards for drinking water quality, 1819
- Chairman*, report of the Committee on Methods of Water Treatment and Laboratory Control, 2051
- NORTON, JOHN F., critical appraisal of experimental work, 1497
- OGDEN, WILLIAM H., billing procedure for a group of small plants, 2201
- OLSEN, ARTHUR K., Creston, Iowa, solves its water problem, 953
- OLSON, H. M., *discussion*—water softening for Wisconsin cities, 119
- census of U. S. municipal water softening plants, 2153
- PEDERSEN, H. V., the superintendent of tomorrow, 91
- PIRNIE, MALCOLM, *Chairman*, report of the Committee on Water Works Practice, 343
- POMEROY, RICHARD, measuring low sulfide concentrations, 943
- POOLE, GEORGE J., maintaining efficiency of centrifugal pumps, 849
- PROBST, JOHN B., values of an adequate civil service system, 1591
- PULHAM, C. J., *see* WOOD, W. H.

- RICHETTA, J. D., Indiana district and short schools, 618
- RICHEY, DALE, relative value of 2 per cent and 5 per cent brilliant green bile confirmatory media, 649
- RIDDICK, THOMAS M., notes on current corrosion problems, 903
notes on current flocculation problems, 908
- RIEHL, MERRILL L., rapid method for the determination of zinc in water supplies, 246
- RIMMER, JAMES H., distribution system maintenance at Cincinnati, 1211
- ROBBINS, EVERITT, 100 per cent meterization program, 1218
- ROGERS, M. E., operation problems in the new Wichita water system, 1233
- ROSSANO, AUGUST, JR., *see* FARNSWORTH, GEORGE, JR.
- SAHND, WILLIAM, distribution system at Cincinnati, 1210
- SANCHIS, J. M., water analysis laboratory of the Public Works Ministry of Venezuela, 277; *erratum*, 826
- SANDERSON, A. U. AND ALLAN, L. F., Toronto's new purification plant and pumping station, 1011
- SCHOONMAKER, GEORGE N., cement lining of water mains at Toledo, Ohio, 1682
- SCOTT, R. D., modification of the fluoride determination, 2018
- SCOTT, ROSSITER S., main and joint repair equipment, 1790
- SHANNON, ALBERT M. AND WALLACE, WILLIAM M., investigating water quality in a distribution system, 1429
- SMITH, HAL F., special rates for federal housing developments, 1638
discussion—joint administration and collection of water and sewer accounts, 1926
- SMITH, L. A., effective management under municipal ownership, 97
- SMITH, MARSDEN C. AND LORDLEY, HOWARD E., super-chlorination and de-chlorination, 249
- SOWDEN, HOWARD J., lime recovery from water softening sludges, 741
- STEWART, E. P., new type reservoir at Syracuse, N. Y., 861
- STOCKWELL, H. P., JR., studies in corrosion control, 1409
- STORRIE, WILLIAM, *see* BERRY, A. E.
- SUTER, MAX, *discussion*—bacterial corrosion of iron and steel, 166
- SWACKHAMER, ROBERT J., protective lighting of water works, 671
- THOMAS, DAVID S., notes on water works defense, 1866
- THOMPSON, LEONARD N., *Chairman*, report of the Committee on Joint Administration and Collection of Water and Sewer Accounts, 1911
- THOMPSON, NELSON, portable pumping and power equipment, 1779
- THRASHER, W. E., auxiliary supply in Westchester County, N. Y., 680
- UNDERWOOD, GOLDEN, cleaning wells at Parkersburg, W. Va., 145
- VAN BRUNT, J. K., cleaning mains at Manasquan, N. J., 755
- VAN NORMAN, H. A., limitations of civil service, 1596
- WALKER, C. C., pumps for small water works, 853
- WALLACE, WILLIAM M., *see* SHANNON, ALBERT M.
- WATSON, K. S., recent stream pollution studies in West Virginia, 1085
- WEIR, W. VICTOR, emergency radio communication, 1166
how to make a motion picture of the water works, 201
- WESTON, ROBERT SPURR, zeolite softening at South Orange, N. J., 255
- WOLMAN, ABEL, *see also* BOSCH, HERBERT regional water supplies, 1875
discussion—revising the U. S. standards for drinking water quality, 2215
- WOOD, W. H. AND PULHAM, C. J., protection of utility services in wartime, 1440
- YOUNG, C. H., *see* MORGAN, L. S.

Index of Abstract Topic Headings

- Accounting and Financing, 1151
Administration, Personnel and Public Relations, 801, 1147
Algae Control, 1296
Apparatus, *see* Laboratory Methods
Bacteriology, 184, 995, 1849
Boilers and Feed Water, 365
Chemical Feeding, Conditioning and Sedimentation, 377, 1843
Chemistry, 1000, 1845
Conditioning, *see* Chemical Feeding
Corrosion and Corrosion Control, 807
Dams, 815
Defense, 171, 779, 1125, 1271, 1612
Distribution Systems—Construction and Maintenance, 983, 2061
Feed Water, *see* Boilers
Filtration, 387, 1832
Financing, *see* Accounting
Ground Water, *see* Wells
Health and Hygiene, 174, 1298
Hydrology, 1287
Hygiene, *see* Health
Impounding Reservoirs, 1294
Industrial Water Supply, 1145
Iron Removal, *see* Softening
Laboratory Methods—Equipment and Apparatus, 988
Maintenance, *see* Distribution Systems
Meters, *see* Services
Odor Control, *see* Taste and Odor Control
Personnel, *see* Administration
Pollution, *see* Stream Pollution
Public Relations, *see* Administration
Pumps and Related Equipment, 976
Quality, 195
Rates, 1156
Reservoirs, *see* Impounding Reservoirs
Sedimentation, *see* Chemical Feeding
Services and Meters, 2068
Softening and Iron Removal, 382, 1837
Stream Pollution and Its Control, 1277
Supply, *see* Water Supply
Taste and Odor Control, 1841
Treatment—General, 372, 1618
Water Supply—General, 1132
Water Supply—Industrial, *see* Industrial
Wells and Ground Water, 197, 2072

Abstract Subjects

A

- Accidents; *see* Hazards, Safety
- Accounting; 1151 *ff.*
relation of, to rate analysis technique, 1156
- Activated carbon; taste and odor control with, 1842
- Acuformis Perennis*; characteristics of, 195
- Administration; 801 *ff.*, 1147 *ff.*
effect of war on, 1617
- Aeration; equipment for; design of, 1618
- Aer. aerogenes*; *see* Coliform bacteria
- Aerobacter cloacae*; gas production by, variations in, 998
- Aerobic cultivation; clear liquid medium for, of anaerobes, 999
- Agar; hardness of, determination of, 1852
standard, comparative study of, 1851
- Agitator; design of, inexpensive, 990
surface, experiences with, 1836
- Aggressivity; newer opinions on, 1008
- Air; colorimetric determination of small quantities of chloropierin in, 1849
dangerous concentrations of chlorine in, automatic detection of, 1847
release of, dissolved in water, 1008
- Air-conditioning; water for, use of corrosion inhibitors in, 1461
- Airplanes; measuring reservoir capacity from, 1295
- Airports, army; *see* Army
- Alberta, Canada; waters of, fluorine content of, 1300
- Alcohol; use of, in washing reclaimed silver nitrate crystals, leads to explosion, 1009
- Algae; control of, 1296 *ff.*
growth of, prevention of, by hypochlorous acid, 1456
- Alkalinity; study of, with various coagulants, 1844
- Allegheny River; watershed of, pollution of, 1283
- Allen salt-velocity method; use of, in flow measurement, 1466
- Alloys; by-product coke industry, corrosion tests on, 813
corrosion of, by flue gases, 814
potentials of, in sea water, 1458
- Alum; use of, in sterilization, 1451
- Alumina flocc; x-ray diffraction study of, 1845
- Aluminon; use of, in determination of aluminum, 1006
- Aluminum; determination of traces of, with aid of aluminon, 1006
sulfate; use of, for coagulation of natural waters at low temperatures, 380
- Amebiasis; *see* Gastro-enteritis
- Ammonia; aqua; use of, for chloramination, 382
taste and odor prevention with, 1842
- Amsterdam, Netherlands; water supply for, 1143
- Anaerobes; aerobic cultivation of, clear liquid medium for, 999
- Anaerobic flora; *Acuformis Perennis*; characteristics of, 195
- Analysis; bacteriological; 184 *ff.*, 995 *ff.*, 1849 *ff.*
boiler scale; method for, 368
boiler sludge; method for, 368
chemical; 1000 *ff.*, 1845 *ff.*
importance of, in determining potability, 197
interpreting results of, 197
relationship of, to corrosivity, 1456
significance of, in judging sanitary quality, 176
colorimetric; determination of two-component color system by, 1006
importance of temperature in, 1847
dimensional; application of, to centrifugal pumps, 977
flow; *see* Flow
- Apparatus; laboratory, 988 *ff.*
- Aqua ammonia; *see* Ammonia
- Aquifers, characteristics of, 197
- Army; airports; water supply for, 1617
camps; water service to, extensions to distribution systems for, 1131

ABSTRACTS

- water supply and sewa gedisposal practices at, 800
- well supply for, 1617
- posts; sanitary report on supplies for, 175
- sanitary engineers in, functions of, 1306
- water supply for, 173, 174, 175
- water supply troops in, functions of, 1613
- Artesian wells; consideration of, on Ogden River project, 2077
- Asthma; sulfur dioxide poisoning as a cause of, 184

B

- Bacilli; dysentery; significance of occurrence of bacteriophage for, in water supplies, 999
- typhoid and paratyphoid; isolation of, simple modification of the Wilson and Blair medium for, 999
- Bacteria; coliform; *see* Coliform bacteria
- contamination by, improbability of, as implement of war, 795
- corrosion by, studies on, 810
- reduction of, investigation of, in sand filters, 1835
- Bacterial quality; modern conception of, 196
- practical aspects of, 196
- standards for, and treatment required, 196
- Bacteriology; 184 *ff.*, 995 *ff.*, 1849 *ff.*
- Bacteriophage; occurrence of, significance of, for dysentery bacilli in water supplies, 999
- rôle of, in self-purification of streams, 187
- Base exchange; capacity for, determination of, for soils and other materials, using the colorimetric manganese method, 1004
- processes of, nomenclature in, 1000
- Basophilia; appearance of, where water contains lead, 183
- Bayou Duplantier Watershed; hydrologic data of, 1292
- Belgium; purification practice in principal supplies of, 372
- Benochlor; controlling aquatic vegetation with, 1296
- Bethlehem, Pa.; 200 years of water works development in, 1135

- Billeting; civilian; organization of, in Liverpool, 1129
- Billing; triplicate forms for, 805
- Biochemical oxygen demand; determination of, 1000
- Biochemistry; of fermentation of rare sugars by coliform bacteria, 193
- of scattered bromine, 1005
- Bitumen; surfacing treatment of impounding reservoirs with, 1295
- Boilers; 365 *ff.*, 1470 *ff.*
- compounds for; use of, to combat scale, 370
- feed water for; *see* Feed water
- Bonding; electrical; cathodic protection of pipe lines by, 1462
- Boston, Mass.; harbor of, pollution of, 1283
- Brines; reclamation of, salt saving by, in zeolite plants, 1839
- refrigeration; corrosion by, influence of dissolved oxygen and pH on, 812
- Brisbane, Australia; water supply of, 1142
- Britain; air raid precautionary measures in, 779
- chlorination practices in, 375
- dam foundation practice in, 815
- observations on defense of, 1612
- post-war reconstruction plans in, 1617
- report of freshwater biological association in, 185
- water supplies in, 1141, 1142
- Bromine; scattered; geo- and biochemistry of, 1005
- Broth; *see* Media

C

- Calcium; carbonate; precipitation of, inhibiting action of minute amounts of sodium hexametaphosphate on, in ammoniacal solutions, 1002
- hypochlorite; ion of, reaction of, with nitrites, 1847
- preservation of, 1455
- sterilization by, 1451, 1455
- Calgon; *see* Sodium hexametaphosphate
- California; State Division of Fish and Game of; pollution control work of, 1279
- Canada; cost and consumption of water supplies in, 805
- filtration practice in, current trends of, 1833, 1834

- tax exemption of publicly owned utilities in, 1149
water works practice in, developments in, from 1850 to 1940, 1138
Carbon; activated; taste and odor prevention with, 1842
dioxide; dissolved; micro-determination of, in pond water, 1847
free; removal of, from natural waters, 1846
removal of, prior to softening, 1840
utilization of; relationship of, to succinic acid formation, by coliform bacteria, 189
Carbonate; calcium; precipitation of, inhibiting action of minute amounts of sodium hexametaphosphate on, in ammoniacal solutions, 1002
effect of, on production of plankton, 1297
Carbonate-ion concentration; effect of, in softening, 383
Caries; dental; study of, including *L. acidophilus* estimations, 1298
Casein; enzymic digestion of, in preparation of peptones, 1851
Cases; court; *see* Legal decisions
Casings; meter; cleaning of, by sand blasting, 2071
well; depth detectors for, 2077
Cathodic protection; constancy of, application in, 1462
corrosion prevention by, in distribution systems, 812, 813, 1461
electrical bonding for, 1462
minimum current required for, determination of, 812
relationship of current density to, 1462
surveys on, using portable potentiometer, 812
Cavitation; corrosion by, 815
occurrence of, in outlet conduits of high dams, 825
Cement; *see also* Concrete
soil corrosion of, 808
Certification; employee, 802
Chatham, Ont.; 1939 and 1940 reports of water works at, 1140
Chemical feeding; 377 *ff.*, 1843 *ff.*
equipment for; design of, 1620
Chemical industry; development of, influence of electrolytic processes on, 1448
water technology in, 1147
Chemistry; 1000 *ff.*, 1845 *ff.*
Chemung River; watershed of, pollution of, 1283
Chloramination; aqua ammonia for, 382
taste and odor prevention by, 1623, 1842
Chlorides; mercurimetric determination of, in weakly mineralized drinking water, 1849
removal of, by synthetic resins, 1003
sodium; solutions of, survival of microorganisms in, 1000
Chlorination; algae control by, 1296, 1297
break-point; sterilization by, 1454
taste and odor control by, 1841, 1842
British practice in, 375
continuous; for protection against contamination of water by enemy action in wartime, 794
de-; influence of, on bacteriological investigation of water, 1000
determination and characterization of coliform bacteria from waters treated by, 1852
floc-forming organisms in water subjected to, 192
improvements in, 1624
presence of coliform bacteria in water after, 191
sterilization by, 1448, 1453, 1455, 2064
super-; sterilization by, 1448
waste water purification by, 1454
Chlorine; dangerous concentrations of, in air, automatic detection of, 1847
germicidal efficiency of; effect of pH on, 1453
measurement of, 1451
handling of, at water and sewage plants, 380
influence of, on hydrolytic action of pepsin, 192
precautions in transport and handling of, 381
solutions of, sterilizing quality of, under different conditions, 1453
Chlorophenol; *see* Phenol
Chloropierin; colorimetric determination of small quantities of, in air, water and food, 1849
Chromates; inhibition of nitrification by, 1847
Citrate mutants; *see* Coliform bacteria

- Clarification; accelerated; equipment for, 1845
- Clarifiers; design of, 377, 378
silt removal by, 378
- Clay; *see* Soils
- Cleaning; main; increasing capacity by, 2066
- Coagulation; aluminum sulfate; use of, in natural waters at low temperatures, 380
ferrous sulfate; treatment with, 1844
magneto-iron sol; purification with, 1843
sodium silicate; 380
various types of, alkalinity and pH studies with, 1844
- Coatings; galvanized zinc; standard methods for controlling thickness of, 1457
protective; effect of, on corrosion-fatigue strength of steel, 1460
- Cocos; use of, in water works practice, 2063
- Coli-aerogenes*; *see* Coliform bacteria
- Coliform bacteria; *Aer. aerogenes*; incidence of, in human fecal excreta, 192
observations on differentiation of, from *Esch. coli* on Levine's simplified E.M.B. agar, 997
antigenic relationships of, 188
citrate mutants; stability of, 998
detection of; lauryl sulfate tryptose broth in, 190, 996
methods for, 997
determination and characterization of, from chlorinated waters, 1852
ecology of, 193
- Esch. coli*; cultivation of, new enrichment methods for, 189
differentiation of, from *Aer. aerogenes* on Levine's simplified E.M.B. agar, 997
examination of supplies for, 996
incubation at 44°C. as a means of indicating presence of, 190
isolation of, from nut meats, comparative study of standard lactose broth and Eijkman medium for, 191
sensitivity of, to cold-shock, during logarithmic growth phase, 193
- Esch. coli mutabile*; lactase of, nature of, 997
- fermentation of rare sugars by, biochemistry of, 193
- incidence of; in chlorinated water, 191
in natural waters of Argentina, 192
in swimming pool water, 998
most probable numbers of, for evaluations of *Aer. aerogenes* tests by fermentation tube method, 187
spore formers; suppression of, in coliform isolation, 189
succinic acid formation by, relationship of carbon dioxide utilization to, 189
- Collections; lenient policy of, advantages of, 1148
- Colloids; organic; boiler feed water treatment with, advantages of, 1471
- Color; comparison of, simple apparatus for, 990
removal of, treatment methods for, 374
two-component system of, colorimetric analysis of, 1006
- Colorimetry; *see* Analysis
- Combustion; submerged; development of, for recarbonation, 381
- Comparator; color; simple construction of, 990
- Compensation; Idaho Workman's Compensation Act; court decision on, for typhoid case, 179
laws on, for illness, 803
New Jersey Workman's Compensation Act; court decision on, for typhoid case, 1306
- Concord, N. H.; water supply of, 1137
- Concrete; *see also* Cement
control of, in masonry dam construction, 819
- Condensers; red-brass; cathodic protection of, 813
refrigeration; corrosion control in, 812
- Conditioning; 377 ff., 1843 ff.
- Conduits; outlet; cavitation in, of high dams, 825
- Conferences; *see* Short schools
- Conservation; water; problem of, in Grand Island, Neb., ground water supply, 200
recharge of underground supply for, 200
- Construction; dam; 815 ff.
distribution system; 983 ff., 2061 ff.
- Consumption; data on; in Canada, 805
in hotels, 1132
increase of, for defense, 1615
- Contamination; *see also* Pollution

bacterial; improbability of, as implementation of war, 795, 1616
 chlorination to prevent epidemic from, by enemy action during war, 794
 ground water; factors in, 2075, 2076
 Control; automatic; governors for, of steam turbines, 980
 in pumping stations, 979
 in well water treatment, 374
 bacteriological; modern methods of, 1849
 distribution system; by automatic valves, 987
 filtration; modern methods of, 1832
 rate-of-flow; improvement of filter operation with, 1837
 Cooling systems; corrosion in, prevention of, 812
 Copper; *see also* Pipe
 colorimetric determination of, with triethanolamine, 1848
 corrosion by, in hot-water systems, elimination of, 811
 detection of small amounts of, in drinking water, 1005
 influence of, with respect to corrosion in boilers, 370
 occurrence of, in hot springs of Japan, 1005
 services; manufacture and use of, 2070
 sulfate; control of plankton by, 1297
 Corrosion; 807 *ff.*, 1456 *ff.*
 boiler; influence of copper in, 370
 locomotive tube; causes and remedy of, 1473
 Couplings; fibers for, 2063
 Cracks; boiler; relationship of, to caustic embrittlement, 1472
Crenothrix; characteristics of, 194
 Crustacea; control of, in water, 1298
 Cultivation; aerobic; clear liquid medium for, of anaerobes, 999

D

Dams; 815 *ff.*
 bombing of, 1616
 Defense, 171 *ff.*, 779 *ff.*, 1125 *ff.*, 1271 *ff.*, 1612 *ff.*
 Defiance, Ohio; break-point chlorination taste and odor control at, 1842
 Density; current; relationship of, to cathodic protection, 1462
 Dental caries; study of, including *L. acidophilus* estimations, 1298

Depreciation; regulatory aspects of, 1154
 Design; boiler; mean temperature difference in, 1473
 rational simplification of, 365
 clarifier; application of experimental methods to, 377, 378
 dam; masonry; basic assumptions of, 817
 types of foundations used in, in Britain, 815
 elevated tank; Charles Hawksley prize for, 985
 filter; application of, to swimming pool system, 1837
 trickling; factors in, 1835
 gasoline pipe line; 1468
 laboratory equipment; 988 *ff.*
 pump; characteristic factors for, 976
 swimming pool; outdoor; methods of, 1133
 treatment plant; U. S. practice in, 1618
 Diesel engines; *see* Power
 Diffraction; x-ray; alumina floe study by, 1845
 Dikes; use of, in reservoirs in Illinois, 1295
 Dilution error; evaluation of, involved in estimating bacterial numbers by the plating method, 188
 Disease; *see also* Health
 application of employee compensation laws to, 179, 803, 1306
 deaths from, data on, in Mexico, 1305
 Dissolved oxygen; *see* Oxygen
 Distilled water; survival of microorganisms in, 1000
 Distribution error; evaluation of, involved in estimating bacterial numbers by the plating method, 188
 Distribution systems; cathodic protection of, *see* Cathodic protection
 construction of; 983 *ff.*, 2061 *ff.*
 substitute materials for, 1273
 extensions to; construction of, for army camps, 1131
 flow in; *see* Flow
 leakage in, prevention of, in wartime, 1615
 maintenance of; 983 *ff.*, 2061 *ff.*
 problems in, resulting from air raids, 1128
 protection of, against air raids, 779
 Dithizone; determination of small quantities of lead with, 1848

Dolomite; semicalcined; iron removal by, 1839
 Drainage; basins; natural water loss in, 1291
 of industrial premises, British legislation regarding, 1281
 Drought; gastro-intestinal derangement during, 182
 Dysentery; *see* Gastro-enteritis

E

Economy; office; standardization of business papers as a method of, 804
 operating; achievement of, by better pump construction, 978
 effect of electric operation on, 805
 treatment; methods of, 1621
 Edmonton, Alta.; softening at, 1841
 Electricity; *see also* Power
 A. C.; corrosion of iron electrodes by, in aqueous electrolytes, 814
 effect of, on water pipes, 1460
 currents; absence of, effect of, on corrosion of steel pipe in clay, 1459
 1940 National Code on installations of, 805
 operation by, economies of, 805
 rationalization of, as a defense measure, 798
 Electrolytes; aqueous; corrosion of iron electrodes in, by A.C., 814
 Electrolytic processes; influence of, on development of chemical industries, 1448
 Embrittlement; boiler; protection against, 372, 1472
 caustic; relationship of, to cracks in boilers, 1472
 relation of, to pitting and corrosion of locomotive tubes, 1473
 Engineers; civil; work of, in defense, 1613
 sanitary; functions of, in U. S. Army, 1306
 water supply; organization of, in U. S. Army, 1613
 England; *see* Britain
 Enrichment; new methods of, for cultivation of *Esch. coli* and fecal streptococci, 189
 Equipment; laboratory; 988 *ff.*
 Ersatz materials; *see* Materials, substitute
Esch. coli; *see* Coliform bacteria

Euglenidae; limitations of, as polluted water indicators, 194
 Evaporation; need for better data on, 1291

F

Fat refining industry; water technology in, 1147
 Feed water; 365 *ff.*, 1470 *ff.*
 improved supply of, at Shopton, Iowa, 1146
 Fermentation; biochemical study of, of rare sugars, by coliform bacteria, 193
 Fibers; use of, in water works practice, 2061
 Filters; 387 *ff.*, 1832 *ff.*
 construction of, substitute materials for, 1273
 Filtration; 387 *ff.*, 1832 *ff.*
 compact plant for, 1136
 electro-automatic; combination of, with softening, in new British plant, 1626
 equipment for, design of, 1619
 Financing; 1151 *ff.*
 Fire protection; emergency supplies for, for defense, 1615
 experience with, during air raids in London, 1128
 increased facilities for, in London, for defense, 1126
 Fire sprinklers; effectiveness of, in London, during air raids, 1128
 Fittings; *see* Pipe
 Flax; use of, in water works practice, 2062
 Floe; alumina; x-ray diffraction study of, 1845
 formation of, from sodium aluminate, effect of water hardness on, 379
 formers; study of, in chlorinated water supplies, 192
 Flocculation; equipment for, design of, 1618
 relation of, to sedimentation, 379
 use of, before filtration, 389
 Floods; 1287 *ff.*
 Flow; *see also* Hydraulics
 calculation of, in simple U-tube boiler, 365
 friction in, in solder type fittings, 1469
 ground water; 197 *ff.*, 2072 *ff.*

- measurement of, Allen salt-velocity method of, 1466
open-channel; measurement of, 1465
turbulence in, 1464
problems of, in hot-water systems, 1469
turbulent; application of, to metering, 1463
diffusive action of, in open channels 1464
types of, for muds, sludges and suspensions in circular pipe, 1465
viscous; application of, to metering, 1463
Flowmeter; capillary; design of, 989
Fluorides; estimation of, 1004
occurrence of, in food and drinking water, 179, 1300
pathological aspects and treatment of, in waters, 180
water- and food-ingested, comparison of effects of, 1300
Fluorine; amperometric titration of, with thorium nitrate, 1004
analysis of, in water, 1004
effect of, on dental enamel, 181
elimination of, from drinking water, 1004
menace of, to health, 181
occurrence of, in drinking water of New Mexico, 181
in ground waters of the Khibin Region, 2076
in some Hungarian waters, 181
removal of, from domestic water, experiments on, 1299, 1300, 1301, 1622
traces of, significance of, 1299
Fluorosis; dental; occurrence of, in Mexico, 181
endemic; bone changes in, 1299
chronic; occurrence of, in northern India, 1301
occurrence of, in South India, 182
Food; colorimetric determination of small quantities of chloropierin in, 1849
fluorides in, 179
handling of, transmission of amebiasis through, 182
staphylococcal poisoning in, third outbreak of, in Hamilton, Ont., 182
Foundations; dam; examples of, in British practice, 815
masonry; preparation of, 817
Free water; authority for provision of, in Ohio, 1158
Freshwater Biological Association of the British Empire; eighth annual report of, 185
Friction; utilization of, as an indicator in titration, 995
Frost penetration; damage to distribution systems by, 987, 2065
depth of, under pavement, 986
permanent; maintenance of service in distribution systems subjected to, 986
protection of meters and services from damage by, 2069
studies on, 986
- G**
- Garbage disposal; sanitary land fills for, 176
Gas; flue; corrosion of metals and alloys by, 814
formers; problem and significance of, 191
liquors; phenol recovery from, in Germany, 1286
mustard; toxicological investigations of waters containing, 796
poison; detection and determination of, in drinking water, 1277
production of, variation in, by *Aerobacter cloacae*, 998
toxic; detection of, in industry, 1010
Gastro-enteritis; amebiasis; transmission of, by food handlers, 182
dysentery; outbreak of, due to stream pollution, 182
occurrence of, during drought, 182
study of, bacteriological techniques in, 1850
Generators; electric; steam-turbine-driven; lubrication of, 981
Geology; methods of, for ground water determinations, 2074
problems of, in regard to masonry dams, 818
Germany; air raid protection measures in, 787
rural supplies of; extension and safeguarding of, 1141
water supplies of, future trends in, 1140

Girders; precast; use of, for roof of filtered water reservoir, 984
 Glucosates; feed water treatment with, 371
 Goiter; endemic; incidence of, related to soil and fresh-water content of iodine, in Ireland, 1304
 Government; regulation by; *see* Regulation
 U. S.; activities of, for control of river pollution, 1277
 Governors; steam-turbine; automatic control by, 980
 Grand Rapids, Mich.; meter practice at, 2071
 Graphical calculation; determination of softening conditions of water by, 1837
 Gravity filters; general data on, 390
 Gray's Harbor, Wash.; pollution in, occurrence and cause of, 1283
 Great Britain; *see* Britain
 Green Bay, Wis.; pollution in vicinity of, investigation of, 1281
 Greenhouses; water conditioning for, 383
 Ground water; 197 *ff.*, 2072 *ff.*; *see also* Wells
 Grouting; importance of, in well construction, 2076
 Guelph, Ont.; 1940 annual report of water works at, 1140

H

Hallock, Minn.; new treatment plant at, 1625
 Hardness; *see also* Softening
 effect of, on formation of floc from sodium aluminate, 379
 magnesium; removal of, 387
 Hardy Cross method; application of, to distribution problem, 1469
 Hazards; *see also* Safety
 employee; analysis of, as cause of accidents, 804
 electric and gas welding as, 803
 Head; loss of, determination of, in uniformly tapped pipes, 1468
 Health, 174 *ff.*, 1298 *ff.*; *see also* Disease meetings; better planning for, 176
 Heating systems; *see* Hot-water systems
 Hemp; use of, in water works practice, 2062

Herbicide; benochlor-3; use of, to control aquatic vegetation, 1296
 Hexametaphosphate; *see* Sodium hexametaphosphate
 Holidays; detection of, improved equipment for, 815
 Holland; *see* Netherlands
 Hotels; water supply problems in, 1132
 Hot-water systems; change of zinc potential in, 812
 corrosion in; elimination of, caused by copper, 811
 prevention of, 1461
 problems of, 811
 flow problems in, 1469
 Houston, Tex.; meter testing and maintenance at, 2071
 Hudson River; lower; watershed of, pollution of, 1284
 Humidity; effect of, on corrosive activity of soils, 809
 Hurricane; floods caused by, in September 1938, 1290
 Hydraulics; 1463 *ff.*
 Hydrogen ion concentration; *see* pH
 Hydrology; 1287 *ff.*
 Hydrolytic action; influence of chlorine, sodium hypochlorite and iodine on, 192
 Hygiene, 174 *ff.*, 1298 *ff.*
 Hypochlorite; *see* Calcium, Sodium

I

Illinois; water problems in, solution of, by dike reservoirs, 1295
 Immunization; efficacy of, in acute outbreak of typhoid, 177
 Impounding reservoirs; *see* Reservoirs
 Incrustation; tufaceous; deposit of, on sand strainer in borehole for water, 809
 Incubation; 44°C.; indicating presence of *Esch. coli* by, 190
 Indiana; stream pollution control in, 1280
 Industrial water supply; *see* Supply
 Infantile paralysis; *see* Poliomyelitis
 Infiltration; vertical; ground water; significance of, for protective zones, 2074
 Inflation; probable effect of, on utilities, 1148

Insurance; mutual; contingent liability under, 1155

Intercrystalline cracks; occurrence of, in locomotive boilers, 372

Iodide; mercuric; recovery of, from Nesslerized solutions, 1847

Iodine; content of, in soil and fresh water, in Ireland, 1304

influence of, on hydrolytic action of pepsin, 192

recovery of, from Nesslerized solutions, 1847

Ireland; northern; water supply in, 1141

Iron; *see also* Mains

bacteria; characteristics of, 194

colorimetric determination of, with salicylaldehyde, 1006

corrosion of; effect of small concentrations of sodium silicate on, 811

influence of low concentrations of sodium silicate on, 1459

electrodes; corrosion of, by A.C. in aqueous electrolytes, 814

galvanized; tarnish and corrosion on, 815

removal of; 382 ff., 1837 ff.

Irrigation; general practices in, in western states, 1133

Isolation; bacilli; typhoid and paratyphoid; simple modification of the Wilson and Blair medium for, 999

Esch. coli; comparative study of standard lactose broth and Eijkman medium for, from nut meats, 191

Italy; Apulian water system of, 1144

army; methods of water supply for, 799

water works practice in, effect of war on, 1616

J

Japan; copper, lead and zinc content of hot springs of, 1005

Jewell brothers; work of, in mechanical filtration, 1833

Joints; *see also* Pipe

bell and spigot; comparative tests on, 984

construction; types of, in masonry dams, 819

fibers for, 2061

substitute materials for, 2064

Jute; use of, in water works practice, 2062

L

Labor policy; five-day week; extent of, in city employment, 804

Laboratory methods—equipment and apparatus; 988 ff.

Lactase; *Esch. coli mutabile*; nature of, 997

L. acidophilus; estimations of, inclusion of, in study of dental caries, 1298

Lactose fermenters; slow; incidence of, in water supplies, 190

Lake Erie; western; limnological study of, 1297

Land values; relation of planning and housing to, in U. S., 1150

Larvae; mosquito; control of, in water, 1298

Law; *see also* Legal decisions

compensation; application of, to employee illness, 179, 803, 1306

relation of, to water rates, 1158, 1159, 1160

technicalities of, on rights of riparian owners, 806

Lead; *see also* Pipe, Services

basophilia from water containing, 183

detection of small amounts of, in drinking water, 1005

determination of small quantities of, with dithionite, 1848

estimation of, in drinking water, 1005

occurrence of, in hot springs of Japan, 1005

pipe; behavior of, in field, 2069

poisoning; non-industrial; observations on, 1304

solution of, in drinking water, 183

Leaks; *see* Mains, Pipe, Plumbing

Legal; concepts; analysis of, of subflow and percolating waters, 198, 2077

decisions; bathing; regulation prohibiting, on impounding reservoir upheld by, in New Hampshire, 175

pollution; damages for injuries due to, granted by, in Mississippi, 182

sanitary tax in connection with privies upheld by, in South Carolina, 177

typhoid; compensation for, under workmen's compensation acts, 179, 1306

Licensing; employee; benefits of, 802

short schools as an aid in, 802
 Lighting; street; methods of, during blackouts, 797
 Lime; corrosion control with, in Biddeford, Me., 808
 sterilization with, 1451
 treatment with, 1843
 Lime-soda softening; theoretical limits of, 385
 use of; in Granite Falls, Minn., 386
 in Ypsilanti, Mich., 385
 with Spaulding precipitators, 384
 Limnology; *see* Algae
 Lindsay, Ont.; improvement of filter operation in, with rate-of-flow controllers, 1837
 Little Rock, Ark.; 1939 annual report of water works at, 1137
 Liverpool, England; billeting of civilians in, 1129
 Logarithmic growth; bacterial; cold-shock during, sensitivity of *Esch. coli* to, 193
 London, England; fire brigade of, 1125
 London, Ont.; 1939 annual report of water works at, 1140
 Los Angeles; Major Disaster Emergency Council of; organization of, for defense, 1614
 Louiseville, Que.; new sources of supply for, 1139
 Lubrication; systems of, for steam-turbine-driven electric generators, 981

M

Magnesium; hardness; removal of, 387
 salts of; determination of dissolved oxygen in presence of, 1846
 Magno-iron sol; coagulation with, 1842
 Magnomass; iron removal by, 1839
 Mains; *see also* Distribution systems,
 Pipe
 cast-iron; age of, in Canada, 2066
 cleaning of, *see* Cleaning
 cost of, estimation of, 983
 maintenance of, use of oxy-acetylene equipment for, 984
 new; sterilization of, 1456
 repair of; internal sleeving for, 2066
 sterilization practice in, in Britain, 792

 six-inch; cost of, in Canada, 2065
 welding of, automatic methods of, 984
 Maintenance; distribution system; 983
 ff., 2061 *ff.*
 precautions for, against air raid damage, 172, 173, 782
 problems in, resulting from air raids, 1128
 valve insertion for, in mains under pressure, 173
 filter; methods of, 1835
 main; sterilization practice in, in Britain, 792
 meter; 2068 *ff.*
 reservoir; methods of, after bombing, 1276
 water system; methods of, during air raids, 782
 Management; *see* Administration
 Manganese; colorimetric; determination of base-exchange capacity of soils and other materials by, 1004
 Maps; *see* Records
 Marietta, Ohio; treatment methods at, 1624
 Maryland State Department of Health; 1940 annual report of, 1306
 Masonry; use of, in dam construction, 817
 Materials; availability of, for water works reconstruction in Netherlands, 1131
 steam-boiler; damage of, from overheating in construction, 1472
 substitute; application of, in distribution systems, 2064
 use of, in German water supplies, 1271
 Media; brilliant green bile; comparison of, with lactose broth, 191
 detection of coliform organisms by, 997
 clear liquid; aerobic cultivation of anaerobes with, 999
 Eijkman; comparison of, with standard lactose broth for isolation of *Esch. coli* from nut meats, 191
 eosin methylene blue agar; Levine's simplification of; observations on differentiation of *Esch. coli* and *Aer. aerogenes* on, 997
 lactose broth; comparison of, with brilliant green bile, 191

standard; comparison of, with Eijkman medium for isolation of *Esch. coli* from nut meats, 191
 lauryl sulfate tryptose broth; detection of coliform organisms by, 996
 sodium lauryl sulfate lactose tryptose broth; use of, as primary medium for detection of coliform group, 190
 Wilson and Blair; simple modification of, for isolation of typhoid and paratyphoid bacilli, 999
 use of, in public health work, 178
 Mercury; detection of small amounts of, in drinking water, 1005
 Metals; by-product coke industry; corrosion tests on, 813
 corrosion of; *see also* Corrosion
 by flue gases, 814
 by soils, 808
 relationship of, with microbiological processes, 1457
 galvanized; corrosion of; controlling factors in, 1457
 potentials of, in sea water, 1458
 Metaphosphate; *see* Sodium hexameta-phosphate
 Metering; application of viscous and turbulent flow to, 1463
 Meters; 2068 *ff.*
 relation of, to rates, 1158
 substitute materials for, 1274
 Venturi; novel construction of, 2067
 Mexico; principal causes of death in, 1305
 Microbiology; processes of, relationship of, to corrosion of metals, 1457
 Micro-organisms; survival of, in sodium chloride solutions and in distilled water, 1000
 Mineral waters; conductimetric determination of salts in, 1002
 Mixing; equipment for; design of, 1618
 Moonlight; influence of, on photosynthesis in fresh water algae, 1298
 Moose Jaw, Sask.; river supply for, 1139
 Most probable number; estimation of, by microscopic method, 188
 evaluation of *Aer. aerogenes* tests with, by fermentation tube method, 187
 evaluation of errors involved in estimation of, by plating method, 188
 use of, in bacteriology, 999
 Motors; drying of, when flooded, 982
 Muds; flow of, in circular pipe, 1465
 oxidation reduction potentials in, 1846

stream sampling in, devices for, 992
 suspensions of; determination of B.O.D. and D.O. of, 1000
 Mundaring Reservoir; safe yield from, 1295
 Municipal ownership; employee morale under, 1149
 five-day week under, 804
 management problems under, 801, 1134
 taxes under, in Canada, unfair exemption from, 1149
 Mustard gas; toxicological investigations of waters containing, 796

N

Natural waters; carbon dioxide removal from, 1846
 oxidation reduction potentials in, 1846
 Nessler; *see* Reaction, Reagent, Tubes
 Netherlands; materials available for reconstruction of water works in, 1131
 water supplies in, 1143
 New York City; fire department of, 1125
 New York Public Service Commission; rules of, for water works corporations, 2068
 Newmarket, Ont.; deep well supply of, 2078
 Nitrate; silver; reclaimed crystals of, washing of, with alcohol, leads to explosion, 1009
 thorium; amperometric titration of fluorine with, 1004
 Nitrification; inhibition of, by chromates, 1847
 Nitrite; azo-xyldic reagent for determination of, 1008
 colorimetric determination of, 1008
 nitrogen; determination of, standards for, 1008
 reaction of, with hypochlorite ion, 1847
 Nitrogen; colorimetric estimation of, with Nessler reagent, sources of error in, 1847
 compounds of, regeneration of, in decomposition of dead plankton, 1297
 nitrite; determination of, standards for, 1008
 photometric determination of, application of Nessler reaction to, 1001
 Northern Pacific R.R.; deep well supply of, 2079

O

- Oak Park, Ill.; servicing and testing meters at, 2070
 Odors; control of, 1841 *ff.*
 Office practice; standardization of business papers in, 804
 Ogden River project; artesian versus surface supply for, 2077
 Ohio River Valley Water Sanitation Compact; progress in adoption of, 175
 Oil; lubricating; effect of, in boilers, 1472
 Open-channel flow; *see* Flow
 Operation; effect of war on, 1615, 1617
 Orifices; circular; small; discharge and coefficients of, 1469
 Owensboro, Ky.; softening at, 1840
 Oxidation reduction potential; in waterlogged soils, natural waters and muds, 1846
 relationship of, to measurement of germicidal efficiency of chlorine, 1451
 Oxygen; consumption; influence on, by bacteria in water, 195
 dissolved; determination of, in river mud suspensions, 1000
 determination of, in solutions, 1846
 colorimetric estimation of, 1845
 influence of, on corrosion by refrigeration brines, 812
 sampling devices for, 991
 Ozone; analysis of, by starch-iodide method, 1007
 commercial; properties and manufacture of, 375
 sterilization by, 1448, 1450
 treatment by, 376

P

- Packing; centrifugal pump; 978
 Paint; non-corrosive; steel work protection with, 1460
 protective value of, methods of determining, 808
 Paper industry; first bleached sulfite mill of, in South, 1145
 water requirements of, 1145
 Paralysis, infantile; *see* Poliomyelitis
 Paratyphoid; *see* Typhoid
 Penns Grove, N. J.; radial well water system at, 2078

- Pepsin; hydrolytic action of, influence of chlorine, sodium hypochlorite and iodine on, 192
 Peptones; chemical and bacteriological studies of, 1851
 preparation of, by enzymic digestion of casein, 1851
 Personnel; 802 *ff.*, 1147 *ff.*; *see also* Short schools
 effect of war on, 1617
 efficiency of, in maintenance practice in wartime, 791
 utility; effect of war on supply of, 1614
 Petroleum industry; use of water in, 1146
 pH; determination of, 1001
 effect of, on germicidal efficiency of chlorine, 1453
 influence of, on corrosion by refrigeration brines, 812
 study of, with various coagulants, 1844
 Phenol; chloro-; taste; prevention of, with ammonia, carbon and break-point chlorination, 1842
 ground water flow determination with, 2074
 recovery of, from waste gas liquors, 1286
 waste; filtration of, through soil for purification, 1835
 Phosphate; colorimetric determination of, 1002
 feed water treatment with, 371
 hexameta-; *see* Sodium hexametaphosphate
 liquors; recovery of tin from, 1287
 poly-; softening with, 1838
 tri-; calcium complexes of, 1848
 trisodium; system; properties of, 1002
 Phosphorus; compounds of, regeneration of, in decomposition of dead plankton, 1297
 Photosynthesis; influence of moonlight on, in fresh water algae, 1298
 Phytoplankton; *see* Plankton
 Pipe; *see also* Distribution systems, Mains, Services
 circular; flow of muds, sludges and suspensions in, 1465
 cleaning of, *see* Cleaning
 copper; corrosion of, 1458
 economic size of, 983
 fittings; copper; manufacture and use of, 2070

- solder type; friction of fluids in, 1469
gasoline distribution; design and construction of, 1468
hot-water; internal corrosion of, inhibition of, 1461
lead; behavior of, in field, 2069
corrosion of, effect of various inorganic salts on, 1459
leaks in; repair of, by plugging with "jelly," 2066
natural-gas; cathodic protection of, 813
pressure; cast-iron; modern engineering practice in, 983
protection of, fibers for, 2063
service; materials used in, 2069
sizes of, standards for calculation of, for house installations, 2068
steel; cathodic protection of, use of zinc for, 812
corrosion of, in water, in absence of electric currents, 1459
underground; cathodic protection of, 813
sub-stream; floating into place of, 2066
underground; corrosion of, methods for control of, 1459
uniformly tapped; head-loss determination in, 1468
Pitting; locomotive tube; causes and remedy of, 1473
Plankton; *see also* Algae
chemical composition of, 1297
control of, by copper sulfate and chlorine, 1297
dead; decomposition of, regeneration of nitrogen and phosphorus compounds in, 1297
mass development of, in Uchinskii Reservoir, 1298
phyto-; occurrence of, in California waters, 1296
production of, effect of carbonate on, 1297
Plumbing; leaks in, systematic check-up on, 2068
Poisoning; sulfur dioxide; asthma caused by, 184
water; causes and prevention of, 184
detection and determination of, 1277
Polio-myelitis; fecal examination in, observations on, 1303
virus of; in stools and sewage, 1304
survival of, in sewer water, 183
Pollution; *see also* Contamination
ground water; chemicals as a cause of, 2075
indication of, limitations of Euglenidae in, 194
stream; 1277 *ff.*
dysentery outbreak caused by, 182
survey of, mechanical aids to, 991
Polyphosphate; *see* Phosphate
Ponds; dissolved carbon dioxide in, micro-determination of, 1847
Portland acid; boiler cleaning with, 1473
Potentiometer; portable; use of, in cathodic protection surveys, 812
Powders; average particle diameter of, measurement of, 994
Power; diesel; economies of, in pumping stations, 979
for pump drives, 979
for transportable emergency pumping sets, 979
economy of, use of elevated tanks for, 985
electric; *see also* Electricity
for deep well pumping units, 982
generators for, lubrication of, 981
necessity for protection of, during wartime, 797
Precipitators; Spaulding; experiences with, in cold lime-soda softening, 384
horizontal type; use of, at Marietta, Ohio, 1624
Pressure; high; progress of, in industrial plants, 1473
Privies; sanitary tax in connection with, upheld by legal decision in South Carolina, 177
Protozoa; rôle of, in self-purification of streams, 187
Providence, R. I.; improvements to treatment plant at, 1624
Public ownership; *see* Municipal ownership
Public relations; 807 *ff.*, 1147 *ff.*
Public Works Administration; projects under, in Maine water works, 1137
Pumping stations; protection of, against air raids, 780
Pumps; 976 *ff.*
trailer; use of, in London, for fire protection, 1126

Purification; *see also* Treatment
functions of bacteria in, 185
magneto-iron sol coagulation in, 1843
present trends in, 1620
self-; rôle of protozoa and bacteriophages in, 187

Q

Quality; 195 *ff.*
bacterial; control of, 1849
interpretation of, 1850
boiler feed water; relation of, to composition of boiler scale, 369
chemical; changes in, in sand filters, 1835
effect of accelerated filtration on, 1833
hygienic determination of, criticism of methods for, 1305
Quincy, Ill.; 1939 annual report of water works at, 1137

R

Radial wells; water system based on, 2078
Rainfall; *see also* Hydrology
analysis of, for 60-year period, 1289
measurements of, use of, in surface runoff determinations, 1289
station-year frequency determinations of, reliability of, 1287
Rameh; use of, in water works practice, 2062
Rates; 1156 *ff.*
Reaction; Nessler; relation of, to effect of temperature on colorimetric determinations, 1847
stability of, and application to photometric determination of nitrogen, 1001
Reagent; azo-xylidic; determination of nitrites with, 1008
Nessler; colorimetric estimation of nitrogen with, sources of error in, 1847
preparation of, 1001
use of, in recovery of mercuric iodide and iodine, 1847
Recarbonation; submerged combustion for, 381
Reconstruction; post-war; materials available for, in Netherlands, 1131
plans for, in Britain, 1617

Records; distribution system; importance of, 984
preparation of maps for, 2065
use of, in maintenance, 983
service box; system for, 2069
Refrigeration systems; corrosion in, prevention of, 812
Regulation; government; London fire brigade hampered by, in defense, 1127
New York Public Service Commission; rules of, for water works corporations, 2068
relation of depreciation to, 1154
use of expert on, to assist in management, 801
utility; relationship of, to defense, 1131
Repair; *see* Maintenance
Reports; financial; simplification of, 1152
Reservoirs; filtered water; use of precast supports and girders for roof of, 984
impounding; 1294 *ff.*
protection of, against air raids, 780
regulation against bathing on, upheld by court, 175
reinforced concrete; repairs to, after bombing, 1276
Resins; synthetic; removal of chlorides and sulfates with, 1003
Resistivity; electrical; use of, in apparatus for testing well waters, 988
Resources; water; summary of, for Mid-Continent area, 1287
Riparian owners; legal technicalities on rights of, 806
Ruhr District; ground water conditions in, 2074
Runoff; surface; determinations of, from rainfall, without using coefficients, 1289
Rural supplies; extension and safeguarding of, in Germany, 1141
Russia; maintenance of service in distribution systems in, in permanently frozen ground, 986

S

Sabotage; considerations in protection against, 171
danger of, of wells, 172
measures against, in New Haven, Conn., 1131
Safety; *see also* Hazards

- measures for, in handling of chlorine, 380, 381
- Salicylaldehyde; colorimetric determination of iron with, 1006
- Salts; conductimetric determination of, in mineral waters, 1002
- contamination of ground water by, 2076
- deposits of, in steam turbines, 367
- dissolved; filtration of, effect of, in sand filtration, 1834
- inorganic; effect of, on corrosion of lead pipes, 1459
- magnesium; determination of, dissolved oxygen in the presence of, 1846
- removal of, by synthetic zeolites, 386
- savings in, by brine reclamation in zeolite plants, 1839
- Sampling; bacteriological; avoiding errors in, 1850
- vibration in, effect of, on bacterial counts, 1852
- stream; mechanical devices for, 991
- Sand; *see also* Filtration
- blasting; cleaning of meter casings by, 2071
- granulometric composition of, precise determination of, 994
- hydraulic transportation of, in refilling slow sand filters, 1834
- removal of, from well water, 2076
- Sanitation; problems of, resulting from air raids, 1128
- Scale; boiler; analysis of, 368
- composition of, in relation to quality of boiler feed water, 369
- formation of, use of x-ray to identify deposits involved in, 369
- inhibition of, by boiler compounds, 370
- removal of, by chemical means, 369
- silicate; occurrence and correction of, in high pressure boilers, 366
- calcium silicate; phases in, identification of, 1471
- formation of, tendency of water toward, measurement of, by short-time tests, 1456
- Schools; *see* Short schools
- Scotland; water supply of, 1141
- Sea water; pollution of, by discharge of sewage, 1284
- potentials of metals and alloys in, 1458
- Sedimentation, 377 *ff.*, 1843 *ff.*
- equipment for; design of, 1618
- Selenosis; chronic; studies of, 1301
- Self-purification; rôle of protozoa and bacteriophages in, 187
- Service; extensions to, beyond city limits, 1157
- interruptions to, minimization of, by extra valves, 2067
- maintenance of, in permanently frozen ground, 986
- Services; 2068 *ff.*; *see also* Pipe
- effect of A.C. on, 1460
- substitute materials for, 1274
- Settling tanks; sludge blanket type; operation of, in Ohio, 380
- Sewage; discharge of, pollution of sea water by, 1284
- disposal of; *see also* Garbage
- methods of, at army camps, 174, 800
- effluent; sterilization of, by chlorine, 1454
- straining of, 1832
- virus of poliomyelitis in, 183, 1304
- Shanghai, China; 1939 annual report of water works of, 1144
- Shopton, Iowa; improved boiler feed water supply at, 1146
- Short schools; use of, in connection with licensing and certification, 802
- water works advancement through, in the Southwest, 802
- Silica; deposits of, in steam turbines, 367
- occurrence of, in boiler feed water, 367
- removal of; from boiler feed water, 1470
- from industrial water supplies, 1145
- from water, 367, 1470, 1471
- scales of, occurrence and correction of, in high pressure boilers, 366
- Silicate; sodium; *see* Sodium silicate
- Silicic acid; removal of, from boiler feed water, 368
- significance of, in operation of high pressure boilers, 368
- Silt; removal of, by clarification, 378
- Silver nitrate; reclaimed crystals of, washing of, with alcohol, leads to explosion, 1009
- Singapore; water supply of, 1144
- Sisal; use of, in water works practice, 2063

- Sleeving; internal; main repair by, 2066
 Slide rule; design of, for water technology calculations, 988
 Sludge; boiler; method for analysis of, 368
 flow of, in circular pipe, 1465
 Sludge blanket settling tanks; operation of, in Ohio, 380
 Sluice gates; large; model tests of, at high velocities of approach and with different pier noses, 825
 Soap; savings in, softening in relation to, 1839
 Sodium; aluminate; formation of floc from, effect of water hardness on, 379
 chloride; solutions of; survival of micro-organisms in, 1000
 hexametaphosphate; calcium complexes of, 1848
 corrosion control with, 808, 1461
 experiences with, 1621
 inhibiting action of minute amounts of, on precipitation of calcium carbonate from ammoniacal solutions, 1002
 softening with, 376, 1838
 hypochlorite; influence of, on hydrolytic action of pepsin, 192
 silicate; dosing with, to aid coagulation, 380
 low concentrations of, influence of, on corrosion of iron in water, 811, 1459
 thiosulfate; stable solutions of, preparation of, 1003
 tri-; phosphate; system; properties of, 1002
 Softening; 382 ff., 1832 ff.; *see also* Hardness
 compact plant for, 1136
 electro-automatic; combination of, with filtration, in new British plant, 1626
 lime-soda; cold process; silica removal by, 1470
 hot process; silica removal by, 1471
 Soils; base-exchange capacity of, determination of, using colorimetric manganese method, 1004
 corrosion by; effect of humidity on, 809
 effect of, on metals and cement products, 808
 investigation of, on Baku-Batum pipe line, 809
 investigation of, with respect to exterior of pipes, 809
 filtration through, treatment of phenol waste waters by, 1835
 natural and artificial layers of, amount of flow and physical phenomena in, 2073
 permanently frozen; maintenance of service in distribution systems in, 986
 water-logged; oxidation reduction potentials in, 1846
 Solids; dissolved; determination of, by evaporation method, in condensed boiler steam, 1473
 granular; pumping of, in fluid suspension, 976
 Spaulding precipitators; *see* Precipitators
 Speed; specific; influence of, on design of pumps and turbines, 977
 terminal; calculation of, 1467
 Sprinklers; fire; effectiveness of, in London, during air raids, 1128
 lawn; discriminatory rates for, 1157
 Standpipes; design of, 985
 inward collapse of, 985
 Starch-iodide method; use of, in ozone analysis, 1007
 Statistics; hydrologic; curve of concentration in, 1292
 Steam; boiler; condensed; dissolved solids in, determination of, by evaporation method, 1473
 circulation of, in water-tube boilers, 365
 sampling of, to detect corrosion, 1456
 Steel; *see also* Pipe, Mains, Tanks
 corrosion-fatigue strength of, effect of protective coatings on, 1460
 nickel and copper alloy; atmospheric durability of, 1457
 protection of, with non-corrosive paint, 1460
 Sterilization; 1448 ff.; *see also* Chlorination
 main; methods of, to prevent pollution after repairs, 792, 2064
 practical methods for, of water consumed by evacuéés, 794
 Storage; use of, to aid treatment, 378
 Streams; pollution in, *see* Pollution
 tularaemia infection found in, 183
 Streptococci; fecal; cultivation of, new enrichment methods for, 189

occurrence of, in swimming pool water, 998

Succinic acid; formation of, by coliform bacteria, relationship of, to carbon dioxide utilization, 189

Sugars; rare; fermentation of, by coliform bacteria, biochemical study of, 193

Sulfates; removal of, by synthetic resins, 1003

Sulfite waste liquors; nitrosolignin colorimetric tests for, 1003

treatment and disposal of, 1285

Sulfur; burner; feed water treatment with, 371, 1472

compounds of, treatment with, 1623

production of, water problems in, 1147

Superheaters; steam; use of, in water-tube boilers, 366

Supersonic waves; purification by, 373

Supply; 1132 *ff.*

adequacy of, in London, during war, 796

cost of, in Canada, data on, 805

effect of war on, 799

emergency; provision of, for defense, 1615

industrial; 1145 *ff.*

powder plant; radial wells for, 1616

methods of, for army and army air-ports, 173, 174

methods of, in Italian Army, 799

protection of, against air raids, 779

sanitary report on, for army posts, 175

Surpluses; disposition of, 1156

Suspensions; flow of, in circular pipe, 1465

fluid; pumping of granular solids in, 976

mud; determination of B.O.D. and D.O. of, 1000

Swimming pools; coliform bacteria and streptococci in, 998

filtration system for, design and operation of, 1837

indoor; bacteriological survey of, in Quebec, 195

outdoor; design and construction of, 1133

purification and heating of water for, 1625

standards and regulations for water quality in, 195

treatment of water for, 375

Switzerland; water supply of, 1144

Sydney, New South Wales; Warragamba water scheme in, 1142

T

Tanks; *see also* Distribution systems

elevated; design of, 985

moving of, by tractors, 2067

power economy by use of, 985

oil storage; cathodic protection of bottoms of, 813

seating of, use of ice cakes for, 2067

steel; cathodic protection of, 813

Tastes; control of, 1841 *ff.*

Taxes; exemption from, discrimination in, in Canadian publicly owned utilities, 1149

expenditure of moneys from, data on, 806

sanitary; levying of, in connection with privies, upheld in South Carolina, 177

Technology; calculations of, slide rule for, 988

Teeth; *see* Caries, Fluorides, Fluorine, Fluorosis, Health

Temperature; effect of, on filter operation, 389

importance of, for colorimetric determinations, 1847

variation in, effect of, on softening reactions in laboratory samples, 1838

Tennessee Department of Public Health; 1937-39 report of, 1305

Textile industry; water for, in Germany, 1146

Thawing; *see* Frost penetration

Thiosulfate; sodium; stable solutions of, preparation of, 1003

Thorium nitrate; amperometric titration of fluorine with, 1004

Threshold odor; old and new tests for, 1841

Tin; recovery of, from waste phosphate liquors, 1287

Tirso Dam, Italy; bombing of, 1616

Titanium; determination of traces of, in natural waters, 1007

Titration; amperometric; fluorine determination by, with thorium nitrate, 1004

friction as indicator of, 995

starch-iodide and ortho-tolidine; rela-

- tionship of, to measurement of germicidal efficiency of chlorine, 1451
- Tornado; water works operation during, 1134
- Toronto, Ont.; drifting and slow sand filters at, 1834
improved chlorination methods at, 1624
- Transportation; hydraulic; application of, to refilling slow sand filters, 1834
- Treatment; 372 *ff.*, 1618 *ff.*; *see also* Purification
corrosion control; methods of, 807
feed water; 365 *ff.*, 1470 *ff.*
methods of, for small town supply, 1136
waste water; phenolic; soil filtration for, 1835
well water; automatic control of, 374
- Triethanolamine; colorimetric determination of copper with, 1848
- Trisodium phosphate; system; properties of, 1002
- Tubes; *see also* Pipe
Nessler; support for, design of, 989
- Tucson, Ariz.; water works improvement at, 1136
- Tularaemia; causative organism of, found in streams, 183
- Turbidity; reduction of, by storage, 378
- Turbines; foundations for, experimental and theoretical investigation of, 980
Kaplan; development of, 979
specific speed of, 977
steam; governors for, 980
portable; emergency service in wartime with, 796
salt and silica deposits in, 367
- Turbulent flow; *see* Flow
- Tygart Reservoir; operation experiences at, 1294
- Tyler, Tex.; operation of treatment plant at, 1625
- Typhoid; bacilli of; isolation of, simple modification of the Wilson and Blair medium for, 999
carriers; spread of disease by, 177
compensation for under Workman's Compensation Act; denied, in Idaho, 179
granted, in New Jersey, 1306
- epidemic; associated with a trailer camp, 1303
at Montreal, 1303
- immunization against, efficacy of, 177, 1302
- outbreak; 53 deaths from, in Manteno, Ill., 178
in Linares, Chile, 178
in the Philippines, 178
water suspected as cause of, in Illinois, 178
- paratyphoid; bacilli of; isolation of, simple modification of the Wilson and Blair medium for, 999
- paratyphoid-B-Schottmuller; small epidemic of, in Germany, 179
- ### U
- Uchinskii Reservoir; blooming of, 1298
- Ultra-violet rays; irradiation by, sterilization by, 1451
- Underdrainage; principles of, as applied to ground water in engineering works, 2072
- U. S. Public Health Service; historical review of work of, 174
- Ohio River Pollution Survey; bacteriological techniques of, in study of gastro-enteritis, 1851
first year's work of, 1280, 1281
research of, in stream pollution, 1278, 1280, 1281
stream surveys of, mechanical aids to, 991
- Urinary calculi; discussion of, 184
- Utah; submerged well field supply in, 2077
- Utilities; effect of war on, 799, 1614
- ### V
- Valves; *see also* Distribution systems
automatic; control by, 987
float; automatic; use of, in Rangoon water supply, 988
insertion of, in mains under pressure, 173
minimizing service interruptions with, 2067
pressure-reducing; operation of, in distribution systems, 988
- Vanadium; quantitative determination of, new method for, 1006

Variability; implications of, on species concept in bacteriology, 186
Vegetation; aquatic; control of, 1296
Viscous flow; *see* Flow

W

Warragamba water scheme; development of, 1142
Washing; surface; filter; experiences with, 1836
Wastage; water; prevention of, in wartime, 1615
Wastes; industrial; pollution by, British legislation against, 1281
purification of by chlorine, 1454
treatment and control of, 1284, 1285
treatment of, recovery of materials in, 1285, 1286, 1287
oil field; disposal of, 1284
phenolic; filtration of, through soil for purification, 1835
Welding; automatic; use of, in mains, 984
hazards of, to workmen, 803
Welland, Ont.; 1940 annual report of water works at, 1140
Wells; 197 *ff.*, 2072 *ff.*
army camp supply from, 1617
construction of, substitute materials for, 1271
danger of sabotage of, 172
deep; pumping units for, at Wingham, Ont., 982
radial; powder plant supply from, 1616
testing in; electrical resistivity apparatus for, 988
West Lorne, Ont.; water supply of, problems in, 1139
Wilson and Blair medium; *see* Media
Workmen's Compensation Act; *see* Compensation

X

X-ray; diffraction study of alumina floc by, 1845
identification of types of scale-forming deposits by, 369

Y

Youghiogheny River; reservoir project on, 1295
Yperite; toxicological investigations of waters containing, 796
Ypsilanti, Mich.; softening at, 1840

Z

Zagreb, Germany; meter practice at, 2071
Zeolites; recent improvements in, 1838
softening by; in East Lansing, Mich., 386
reducing salt consumption in, by brine reclamation, 1839
synthetic; salt removal by, 386
treatment for chemical impurities with, 1621
Zinc; anti-corrosiveness of, 1457
determination of traces of, in biological material and in natural waters, 1006
galvanized; coatings of, standard methods for controlling thickness of, 1457
occurrence of, in hot springs of Japan, 1005
potential; change of, in hot-water systems, 812
rôle of, in cathodic protection of steel pipes, 812

Authors of Abstracted Articles

- ABRAMSON, D. S., 1457
 ADAMS, M. P., 1284
 ADAMS, R. B., 1852
 ALDAMA, C. A., 1305
 ALEXANDER, L. J., 1840
 ALLEN, W. E., 1296
 ALLMAN, L. W., 1136
 ALLPORT, N. L., 1006
 ALYEA, H. N., 989
 ALZAMORA, F. C., 1009
 AMMER, G., 371
 ANDREONI, R., 796
 ANDREWS, W. O., 1472
 ANGEL, C. M., 808
 ANTILL, J. M., 1142
 APPLEBAUM, S. B., 384, 1621, 1621
 ARBATSKY, J. W., 1837
 ARDREY, W. B., 1451
 ARNOLD, F. A., JR., 1298, 1299
 ARNUM, W. I. V., 1296
 BARBITT, H. E., 1465
 BACH, J. M., 1004, 1006
 BAESE, E., 2068
 BAHLMAN, C., 387
 BAIER, C. R., 184
 BAILEY, G. B., 979
 BAILEY, W. T., 1296
 BAKER, M., 188
 BAKER, M. N., 1833
 BAKKE, O. M., 1840
 BARTLETT, T., 1147
 BARTON, C. J., 1848
 BATT, G., 194
 BATY, J. B., 380, 802
 BAUER, W. W., 176
 BAUMANN, P., 821
 BAYLIS, J. R., 196, 1835
 BEAUMONT, A. G., 1613
 BEDERT, W., 1459
 BEHRMAN, A. S., 367
 BENNINGER, H. H., 1460
 BENSON, H. K., 1003
 BERK, A. A., 372
 BERMAN, M., 1469
 BERNARD, M., 1288
 BERRY, A. E., 195, 805, 1138, 1617, 1833
 BERRY, G., 172, 779, 786
 BETZ, L. D., 1470, 1471
 BEUTHE, H., 373
 BIELENBERG, R. G., 368
 BIEMOND, C., 1131
 BIGWOOD, B. L., 1290
 BILLINGER, R. D., 1135
 BINNIE, W. J. E., 822, 1449
 BINNS, G., 1129
 BLACKMORE, W. E., 985
 BLUME, A. L., 1153
 BOND, D. H., 813
 BOOTH, H., 1157
 BOOTHMAN, A., 172, 779, 786
 BORNER, H., 1843
 BOUCHER, P. L., 1832
 BOUCHER, R., 825
 BOUDREAUX, G., 1003
 BOWDOIN, C. D., 177
 BOWER, C. A., 1004
 BOWMAN, J., 1449
 BOWMAN, R. A., 1473
 BRAY, R. H., 1002
 BREED, R. S., 1851
 BREWER, J. H., 999
 BRIERLEY, J., 2072
 BRIGGS, R. R., 1472
 BRIGGS, W. E., 1473
 BRINES, M. E., 369
 BRITTON, J., 1836
 BRITTON, J. A., 803
 BROD, H. W., 1288
 BROOKS, J. H., 813
 BROWN, C., 188
 BROWN, D. L., 1473
 BROWNE, F. G., 979
 BROWNSTEAD, J. P., 378
 BRUCE, H. H., 1469
 BRUCE, H. T., 1136
 BRUINS, P. F., 1469
 BRUK, E. S., 1297
 BRUNS, H., 2075
 BUCHANAN, R. E., 186
 BUEHRER, T. F., 1002
 BUNN, C. W., 1471
 BURNHAM, L. M., 1157
 BURNS, W. E., 1850
 BURWELL, J. H., 805
 BUSTAMANTE, M. E., 1305
 BUSWELL, A. M., 192, 382, 385
 BUTTERFIELD, C. T., 185
 BUYDENS, R., 1455, 1623
 CAIN, G. A., 371
 CALDWELL, D. H., 1465
 CALVERT, J. T., 1449
 CAMP, T. R., 1837
 CAMPBELL, M. S., 1454
 CARNAHAN, C. T., 991, 1616
 CAROLLO, J. A., 1136
 CARPENTER, L. V., 176, 366

ABSTRACT
AUTHORS

- CARR, E., 2070
 CARRIEU, 178
 CARTER, G. N., 825
 CAUGHEY, R. J., 980
 CECIL, T. A., 1615
 CHALMERS, H. N. M., 1304
 CHANDLER, D. C., 1297
 CHARLEWOOD, C. B., 366
 CHATELAIN, J. B., 371, 1147, 1623
 CHATLEY, H., 976
 CHUIKO, V. T., 1007
 CHWALA, A., 1838
 CLARK, J. D., 181
 CLARK, L. M., 1471
 CLARK, R. E. D., 995
 CLARKE-HAFSTAD, K., 1287
 CLEARY, E. J., 1131, 1134, 1281
 CLERC, M., 812
 COATES, J. J., 366
 COCEA, E., 192
 CODE, S. B., 985
 COLBURN, A. P., 983
 COLLINS, I. G., 190
 COLLINS, J. H., 1614
 CONKLING, H., 200
 COOPER, A. M., 1149
 COREY, H., 797, 1614
 CORPUS, T., 178
 CORYEA, C. E., 1473
 COTTERELL, A. P. I., 1449
 COUCHMAN, C. E., 990
 COUGHLAN, R. E., 1473
 COWLIN, F. J., 981
 COX, C. D., 983
 COX, C. R., 807
 COX, G. L., 813, 1458
 COX, G. N., 1292
 CREAGER, W. P., 820
 CRISP, A. E., 1617
 CROSBY, I. B., 818
 CYR, R., 195, 1139

 DABAC, V., 2071
 DALLAVALLE, J. M., 999
 DANNENBAUM, J. B., 1147, 2076
 DARBY, C. W., 190, 996
 DARDANELLI, P. V., 811
 DARLING, E. H., 1133
 DAVIES, D. G., 816, 1616
 DAVIS, A. R., 984, 1157
 DAVIS, E., 1612
 DAY, C. D. M., 1301
 DEAN, H. T., 1298, 1299
 DEBERARD, W. W., 374
 DECKERT, W., 1849
 DE GRAAF, J. A., 2061
 DE HALLER, P., 815
 DELAPORTE, A. V., 195
 DE LA RIVIERE, R. D., 794
 DENHOLM, E. W., 816

 DESROCHES, E., 389
 DICKMAN, S. R., 1002
 DIENERT, F., 1284
 DODSON, L., 802
 DOHR, J. L., 1151
 DOLAN, T. J., 1460
 DONALD, M. B., 379
 DONOSO, J., 178
 DOSSETT, J. H., 1142
 DOWNIE, C. C., 1287
 DUHNSEN, W., 1834
 DUNBAR, R. E., 989
 DURHAM, G. E., 1472
 DUSSERT, 373
 DUTTON, M. S., 2070

 EBNER, W., 983
 EDMUNDS, F. H., 809
 EDWARDS, W. R., JR., 1003
 EGGLESTON, H. R., 1624
 ELVOVE, E., 1298, 1299
 ERIKSEN, A., 1283
 EVANS, E. B., 1844
 EVLANOVA, A. V., 1839
 EWING, S., 1462
 EYMER, H. H., 2066

 FABIAN, F. W., 1851
 FAIGENBAUM, H. M., 1283, 1284
 FAUST, R. J., 386
 FAWKES, A. W. E., 1139
 FELLOWS, C. H., 370
 FERRAMOLA, R., 190, 192, 995
 FIELD, J. T., 193
 FILBY, E. L., 384
 FINK, C. G., 1448
 FINLAY, G. R., 814, 1301
 FINNIECOME, J. R., 976, 977, 979
 FISCHER, H., 1848
 FITZGERALD, P. E., 369
 FLEBUS, C. G., 795, 1616
 FLOYD, O. N., 823
 FOLPERS, T., 1839
 FOLPMERS, T., 189
 FOLTZ, A. V., 1836
 FORBES, H., 199
 FORD, R. L., 1004
 FOX, M. C., 1154
 FRANCE, R. L., 998
 FRASER, O. B. J., 813
 FREIBERG, G. W., 191
 FRITSCH, V., 2072
 FULLER, H. U., 986, 2065
 FULLER, J. E., 998
 FULLERTON, R. M., 801, 1148
 FULTON, A. A., 987, 988
 FURBACH, E., 373

 GARNER, J. H., 1281
 GEAR, H. C., 813

- GELSTEIN, A., 192
 GIBBONS, M. M., 1296
 GILLETTE, D. W., 799
 GILLO, L., 1001
 GLADDING, R. D., 1468
 GOERKE, H., 367
 GOETZ, H. C., JR., 1471
 GOLUBEVA, M. T., 380
 GONZALEZ, M., 181
 GOODEN, E. L., 994
 GORDON, J., 372
 GORMAN, A. E., 388
 GOTTING, H., 984, 1271
 GRAF, W. W., 372
 GRANT, E. L., 1289
 GRAY, M. T., 388, 1139
 GREELEY, S. A., 1283
 GREEN, G., 1852
 GREGOIRE, A., 1455
 GRIFFIN, A. M., 193
 GRIME, E. M., 2078
 GRISWOLD, H. W., 2069
 GROESBECK, E. C., 1461
 GUILLAUME, A., 1455
 GUILLERD, A., 1284
 GUSEVA, K. A., 1298
 GUSTAFSON, H., 367

 HAASE, L. W., 811, 1008
 HADLEY, H. M., 822
 HADLEY, R. F., 810
 HAERING, D. W., 812
 HALL, G. A., 380, 1625
 HALL, G. L., 1306
 HAMMACHER, J., 1450
 HANCOCK, A. P., 1148
 HANEMANN, H., 2069
 HANKS, J. H., 188
 HANNEMANN, O., 987
 HARDING, H. A., 1303
 HARMON, B., 2075
 HARRELL, D., 812
 HARRINGTON, A. W., 1290
 HARRINGTON, C. C., 1839
 HARRIS, R. B., 199
 HARRIS, W. E., 1301
 HARTUNG, H. O., 196
 HARTWELL, O. W., 1290
 HARVEY, L., 805
 HASELDINE, J. F., 1276
 HATCH, G. B., 376, 808, 1456
 HAUPT, H., 183
 HAYDOCK, C., 171
 HAYS, J. B., 823
 HEGARTY, C. P., 193
 HERTER, M., 1847
 HERZIK, G. R., 1850
 HETTICHE, H. O., 2074
 HEWITT, C. H., 1847
 HICKS, W. F., 1296

 HILLS, B. M., 1625
 HIPPE, L., 179
 HIRSCH, A. A., 988
 HODGES, P. V., 1288
 HOFEFLE, K. F., 1157
 HOFMANN, W., 2069
 HOLADAY, K. M., 812
 HOLLER, H., 1141
 HOLTON, P. J., JR., 1456, 1624
 HOMMON, C. C., 380
 HOOK, A. E., 1851
 HOOVER, C. P., 1621, 1622, 1836, 1842
 HOOVER, E. F., 1136
 HORNER, J. L., 1147
 HORNER, W. W., 1289
 HOSKINS, J. K., 187, 1278
 HOUGH, B. K., JR., 824
 HOUK, I. E., 817
 HOUSTON, C. W., 1000
 HOUSTON, E. C., 989
 HOWARD, N. J., 997, 1615, 1620, 1832, 1834, 1849
 HOWE, D. E., 1006
 HOWSON, L. R., 801
 HUGHES, E., 186
 HUMPHREYS, W., 1284
 HUNTER, A. C., 191
 HUPP, E. R., 189

 INGLEE, C., 2066
 IRWIN, C. H., 1841
 IVLEV, V. S., 1298

 JACK, L. B., 1149
 JACKSON, J. A., 1155
 JACOBS, J., 817
 JAMES, D. F., 188
 JAMES, K. A., 1469
 JANSSEN, L., 372
 JARVIS, C. S., 1288
 JAY, P., 1298
 JENKINS, S. H., 1847
 JENNISON, M. W., 188
 JENS, S. W., 1289
 JOHNS, G. A., 1472
 JOHNSON, G. D., 1469
 JOHNSON, M. L., 1845
 JOHNSON, W. S., 196
 JOOS, C. E., 1456
 JUDAY, C., 1006

 KALINSKE, A. A., 1464
 KASPER, K., 789
 KASSNER, E. E., 1003
 KASSNER, J. L., 1003
 KATZ, W., 1846
 KEARNEY, S., 2065
 KEELING, H. J., 812, 815
 KEENER, K. B., 817
 KELLER, G., 2074

- KEMP, M., 1453
 KENDALL, T. R., 385
 KENDALL, V. V., 1456
 KENNISON, H. F., 1289
 KENWORTHY, L., 811
 KEY, T. D., 377, 378
 KHAL'FIN, F. H., 994
 KILLIAN, P., 807
 KINNISON, H. B., 1290
 KIRCHRATH, H., 1147
 KISSKALT, K., 2074
 KLARE, M., 797
 KLAS, H., 1461
 KLINGMAN, F. W., 1842
 KLOUMAN, F., 987
 KLUMPP, J. B., 1843
 KNAPP, G. S., 1287
 KNAUSS, W., 797
 KNILL, W. C., 784
 KNORR, M., 2074
 KNUDSON, H. W., 1006
 KOBE, K. A., 1002
 KOHN, F., 197
 KOOLJAMS, L. H. L., 1839
 KOPJEV, S. F., 1461
 KUHN, R. J., 813
 KUL'BERG, L. M., 1006
 KUNI, V. E., 1454
 KURODA, K., 1005

 LACKEY, J. B., 194
 LADUE, W. R., 2071
 LAMMERS, F. J., 1845
 LANDEL, E., 787
 LANG, A., 2075
 LANGER, A., 1004
 LANZ, R. L., 379
 LAPIN, L. N., 1849
 LAQUE, F. L., 1458
 LARSON, T. E., 382, 383, 385
 LAUGHLIN, H., 1841
 LAUTER, C. J., 382
 LEIBOV, Z. M., 1005
 LEIFSON, E., 1851
 LEIPPER, A., 1002
 LEMBCKE, P. A., 1303
 LEMBERG, K., 1140
 LEOPOLDI, G., 1848
 LEVINE, M., 1453, 1852
 LEWIS, A. C., 982
 LEWIS, M. R., 199
 LEWIS, W. Y., 365
 LIEURANCE, R. S., 817
 LILLIE, R. D., 1301
 LINDQUIST, E. G. W., 390
 LINDSAY, F. K., 368
 LINFORD, A., 1463
 LISBONNE, 178
 LIVINGSTON, P., 2076
 LLOYD, D., 1292

 LLOYD, J. M., 1625
 LOCHHEAD, A. G., 997
 LOGAN, J., 1840
 LONGLEY, F. F., 799
 LOPEZ, S. R., 1302
 LORDLEY, H. E., 1843
 LOWE-BROWN, W. L., 815, 817
 LUBIMOVA, A. A., 809
 LUDLAM, M., 999
 LULL, G. F., 175
 LYMER, B. J., 977
 LYNCH, H. B., 1290

 MACDONALD, F. W., 802
 MACGREGOR, M., 1141
 MACKENZIE, E. F. W., 793, 1448, 1450
 MACPHAIL, J. B., 825
 MADDEN, J. T., 1153
 MAGUIRE, J. J., 1470, 1471
 MAHADEVA, S., 1158
 MALBIN, B., 1302
 MALLMANN, W. L., 190, 996, 1451, 1851
 MANLEY, C. H., 1005
 MANN, E. H., 181
 MANNING, F. G., 1850
 MANNING, W. M., 995
 MANUILOVA, G. A., 1000
 MARKWITH, R. H., 175
 MARSH, J. A., 1842
 MARSHALL, T. C., 812, 813
 MARTIN, P. J., JR., 1136
 MARTINA, A., 1838
 MASCHERONI, H. A., 1299
 MASON, M. A., 1466
 MASSEY, A., 1128
 MASTERSON, W. D., 1148
 MATEI, I., 192
 MATHESON, D. H., 390
 MATTHEWS, F. J., 812, 1621
 MATUBARA, T., 1459
 MAZZOTTI, L., 181
 MCBRIAN, R., 1470
 MCCCLURE, F. J., 179, 1300
 MCCRADY, M. H., 997
 MCDIARMID, F. J., 1155
 McDONNELL, R. E., 2065
 McDOWELL, E. T., 808
 McLACHLAN, J. A., 197
 MEDAUGH, F. W., 1469
 MEIER, F. E., 1297
 MEINZER, O. E., 199
 MELLON, M. G., 1006
 MELOCHE, V. W., 1006
 MENSCH, L. J., 821
 MEN'SHCHIKOV, I. V., 1847
 MERWE, P. K. v. d., 1299, 1300
 MEYER, A. F., 1294
 MICHELSON, I. D., 997
 MILLER, L. B., 379, 1145
 MILLIGAN, W. O., 1845, 1845

- MILLS, W. S., 1837
 MITCHELSON, A. T., 200
 MIX, A. E., 1004
 MONEYMAKER, B. C., 822
 MONTEVERDE, J. J., 190
 MOON, A. M., 2066
 MOON, C. D. B., 1006
 MOORE, W. A., 1000
 MOROZ, V. P., 1849
 MORRAL, F. R., 815
 MORRIS, R. M., 1294
 MORRISON, R. B., 988
 MORTIMER, C. H., 1846
 MOSIER, J. A., 1840
 MOZZHUKHIN, P. V., 374, 1833
 MUEGGE, O. J., 2076
 MUELLER, A. C., 1473
 MUKHAREVSKAYA, M. I., 1298
 MUNOZ, J. M., 1299
 MURPHY, E. J., 814
 MURPHY, J. J., 804
 MUSELMANN, R., 2074

 NAGLE, W. M., 1473
 NEEDLANDS, A. R., 816
 NELIDOV, I., 823
 NEOGI, S., 997
 NEVEU, R., 1451
 NEWTON, F. A., 1156
 NICHOLS, M. S., 180
 NICOLAS, Y., 1455
 NOLL, C. A., 1470, 1471
 NORCOM, G. D., 1622

 O'BRIEN, R. A., 372
 O'CONNOR, P. J., 1838
 OSTROLENK, M., 191
 OTHMER, D. F., 1469
 OWENS, F. R., 370
 OYAMA, T., 1847

 P., V., 799, 986
 PALMER, C. E., 1836
 PANDIT, C. G., 181
 PANKEY, T. L., 1145
 PARKER, L. T., 803, 806
 PARR, L. W., 998
 PARTRIDGE, E. P., 1456
 PATON, W. A., 1152
 PAUL, C. H., 817
 PAUL, J. R., 1303, 1304
 PAULSEN, C. G., 1290
 PEARL, I. A., 1003
 PEARSALL, W. H., 1846
 PEDEN, D., 996
 PEHRS, M., 1305
 PERKINS, W. A., 821
 PETERS, W. F., JR., 367
 PETRIE, L. M., 177
 PILLING, N. B., 1457

 PINCUSSEN, L., 1847
 PLACAK, O. R., 1000
 PLATONOVA, M. N., 1454
 POE, C. F., 193
 POLAND, J. F., 988
 POOLE, B. A., 1280
 POTTINGER, R. E., 1847
 POWELL, S. T., 366, 371
 POWELL, W. J., 1134
 PRATHITHAVANJA, B., 1849
 PRATT, F. R., 986
 PREVOT, A. R., 195
 PRUSS, M., 1285
 PUNCOCHAR, J. F., 192
 PURCELL, W. R., 1845, 1845

 RAFLE, P. J., 1303
 RAMBAULT, 178
 RATHE, W., 2074
 RAVEN, C., 996
 RAWN, A. M., 1284
 REEDY, R. J., 192
 REID, G. U., 977
 REILLY, T. L., 1294
 REINACH, N., 184
 REINDOLLAR, W. F., 1009
 REINFEL'D, E. A., 1457
 REITEMEIER, R. F., 1002
 RENY, F. J., 1137, 2069
 RESSMANN, 815
 REUSSI, C., 1299
 REYNOLDS, D. H. B., 783
 RHODES, A. J., 999
 RIAL, W. P., 1144
 RICE, C. W., 1472
 RICE, O., 808, 1622, 1852
 RICH, G. R., 820
 RICHTER, A., 386
 RIEGEL, R. M., 821
 RINEY, A. H., 1468
 ROBERTS, G. E., 1142
 ROBERTS, J., 182
 ROBERTSON, J. E., 1134
 ROBERTSON, J. M., 1464
 ROBERTSON, S. A., 365
 ROBERTSON, W. A., 1133
 ROBINSON, D. W., 1145
 ROE, A. F., 1852
 ROGERS, W. F., 1462, 1463
 ROMANOFF, A., 184
 RONALD, D., 794
 ROUTLEDGE, C. G., 2065
 ROVINSKAYA, E. I., 1006
 ROZSA, P., 1277
 RUCHHOFT, C. C., 1000, 1000
 RUDY, H., 1848
 RUGG, C. F., 1289
 RUPP, D. H., 376
 RYAN, W. F., 1473

- ST. HILL, F. A., 1453
 ST. LAURENT, G. C., 1132
 SANDERA, K., 1002
 SANDWISCH, R. H., 1621
 SAN JUAN, J. T., 178
 SAPIRIE, S. W., 375
 SARCHET, B. R., 983
 SAUER, W., 197
 SCALES, F. M., 1453
 SCHAPHORST, W. F., 977
 SCHAUT, G. G., 182
 SCHEMEL, R., 1157
 SCHIKORR, G., 812
 SCHIMPF, G. W., 1847
 SCHLOESSER, H., 1848
 SCHNEIDER, J. H., 2064
 SCHOENLEBER, A. W., 182
 SCHROEDER, W. C., 372
 SCHULEN, E. P., 825
 SCHULEK, E., 1277
 SCHULZ, E., 1472
 SCHWABE, L., 1146
 SCHWARTZ, M. C., 1003
 SCHWARZLER, C., 807
 SCHWEIGL, K., 2072
 SCHWORM, W. B., 191
 SCIVER, A., 1450
 SCOTT, L. H., 381, 2064
 SCOTT, W. M., 1469
 SELIVANOV, L. S., 1005
 SETTER, L. R., 176
 SHAW, P. A., 1158, 1279
 SHEE, J. C., 1304
 SHELTON, L. R., JR., 998
 SHINN, M. B., 1008
 SHIPLEY, J. W., 814
 SHNIDMAN, L., 814
 SHUCKOVA, A. M., 1844
 SHUEY, B. S., 1844
 SHUSTOVA, L. N., 374, 1833
 SILCOX, H. E., 813
 SILLITTO, A. G., 1008
 SIMONDS, A. W., 822
 SKOPINTSEV, B. A., 380, 1297
 SMALL, A., 805
 SMALL, L., 2067
 SMITH, C. M., 994
 SMITH, E. E., 380
 SMITH, F. E., 191
 SMITH, M. I., 1301
 SMITH, N. L., 1154
 SMITH, O. M., 1004
 SMITH, R. S., 194
 SMITH, W. T., 812
 SNOW, B. F., 199, 374
 SNOW, F. H., 1295
 SOLOV'EV, A. V., 809, 809
 SORENSEN, C., 373
 SPACEK, L. P., 1152
 SPENCER, W. R., 802
 SPITTA, O., 176, 187
 SPLITTGERBER, A., 368
 SPURWAY, C. H., 383
 STAGER, H., 1459
 STAPLEY, E. R., 802, 1836
 STEELE, B. W., 819
 STEYN, D. G., 184
 STIPP, A. C., 198, 2077
 STOHLMAN, E. F., 1301
 STONE, C. M., 188
 STRAUB, J., 181
 STREATFIELD, E. L., 1846
 STRICKLAND, G. H., 389, 1617
 STUART, A. H., 1457
 STUART, C. A., 188, 193
 STUNDL, K., 1835
 SUEDKAMP, J. E., 382
 SUGAWARA, K., 1847
 SUTER, M., 192
 SUTHERLAND, R. A., 820
 SUVOROVA, R. V., 1839
 TANNER, F. W., 1000
 TAYLOR, D. R., 983
 TAYLOR, F. S., 1625, 1842
 TEIS, K. R., 1146
 THACKWELL, H. L., 1838
 THAYER, H., 2077
 THEIS, C. V., 197
 THIELE, H., 1305
 THIEM, G., 2073
 THOMAS, H. A., 825
 THOMPSON, D. G., 172
 THOMPSON, L. N., 383
 THOMPSON, R. E., 1624
 THORN, F. C., 978
 THORP, C. E., 1007
 THUMA, R. A., 1298
 TIEMERSMA-WICHERS, G. M., 809
 TISDALE, E. S., 1280
 TOLMAN, C. F., 198, 2077
 TOMLINSON, G. H., 1285
 TOWNSEND, L. D., 1283
 TRASK, J. D., 1303, 1304
 TRAXLER, H., 806
 TRAY, S. E., 1145
 TREADWELL, E. F., 199
 TRELLES, R. A., 1004, 1006
 TRUOG, E., 1004
 TUEPKER, D. J., 1151
 TULLY, J. P., 1009
 TUPHOLME, C. H. S., 371, 1459
 TURNBULL, W. J., 825
 TURNER, H. G., 1836
 TURNER, W. D., 367
 TUTHILL, L. H., 822
 TYAGARAJA, S., 999
 TYLER, I. L., 819
 TYO, Z., 1834

- ULMER, R. C., 1473
UNWIN, R., 1150

VAKSBERG, N. M., 1847
VAN NIEVELT, B. F., 1144
VANSELOW, A. P., 1001
VERONELLI, D. J. E., 811, 1459
VESSELOWSKY, S., 980
VINOGRADOV, A. P., 1297
VOLKOV, P. I., 370
VON GONTARD, A., 812
VON POST, E., 381
VOZNESENSKII, S. A., 1839

WADSWORTH, G. P., 188
WALKER, C. L., 802
WALKER, J. H., 1456
WALKER, O. J., 1300, 1301, 1622
WALSH, E. L., 803
WALSHE, R. L., 1141
WALTERS, R. C. S., 1449
WALTON, R., 377, 378
WARREN, A. C., 1134
WATANABE, I., 369
WATANABE, M., 1458
WATSON, D. M., 1449
WATSON, R. G., 1841
WATZEL, R., 1848
WEBER, B., 2074
WEBER, G. R., 1453
WEEKS, O. B., 193
WEISER, H. B., 1845, 1845
WELDE, V. J., 376
WELLINGTON, S. H., 1453
WENZEL, L. K., 200, 2073
WERKMAN, C. H., 189
WESLEY, W., 368
WESLEY, W. A., 1457, 1457
WEST, J. A., 1125
WESTFALL, B. B., 1301
WHITE, E. G., 1454

WHITNEY, R. J., 1845
WHITSON, M. T. B., 376
WIEGMANN, H., 1286
WIEL, S. C., 198
WIESBROCK, H., 183
WILCOXSON, L. S., 1285
WILDON, C. E., 383
WILHELM, R. H., 990
WILLIAMS, A. E., 375
WILLIAMS, G. R., 1291
WILLIAMS, J. A., 1148
WILLIAMS, N., 1462
WILM, H. G., 1465
WILMOTH, V. J., 786
WILSON, E. K., 2064
WILSON, H. M., 1295
WILSON, J. H., 1461
WILSON, R. J., 182
WINKLER, A., 183
WOLFE, E. E., 1455
WOLPERT, N. N., 1137
WOOD, H. G., 189
WOOD, J. N., 784, 816
WOODRING, R. W., 1135
WOOLLEY, R. R., 2077
WORDLEY, E., 186
WRIGHT, H. D., 996
WRIGHT, W. A. S., 813

YEAW, J. S., 814
YODER, J. D., 1470
YOE, J. H., 1848
YOUNG, J. E., 387
YOUNG, J. W., 1295

ZAY'YALOV, I. N., 2076
ZHUKOV, A. I., 1835
ZIEGLER, N. R., 998
ZIMMERMAN, A., 188
ZOBELL, C. E., 195
ZVENIGORODSKAYA, A. Y., 1000

